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Preface

This book is your guide to configuring and managing your MERANT™ DataDirect® SequeLink® 5.1 environment. Read on to find out more about your SequeLink environment and how to use this book.

What Is DataDirect SequeLink?

DataDirect SequeLink is a middleware product that provides point-to-point connections from client to server for the latest data access standards, including Open Database Connectivity (ODBC), Java Database Connectivity (JDBC) applications, and ActiveX Data Objects (ADO) applications.

Using This Book

This book assumes that you are familiar with your operating system and its commands; the concept of directories; the management of user accounts and security access; and your network protocol and its configuration.

This book contains the following information:

- [Chapter 1 “Introduction” on page 27](#) introduces some concepts that will help you understand how to configure and manage your SequeLink environment.

Part 1: Configuring and Managing SequeLink Services

- [Chapter 2 “Using the SequeLink Manager Snap-in” on page 45](#) describes how to use the SequeLink Manager Snap-in.
- [Chapter 3 “Configuring SequeLink Services Using the SequeLink Manager Snap-in” on page 61](#) describes how to create and manage SequeLink services with the SequeLink Manager Snap-in.
- [Chapter 4 “Configuring Server Data Sources Using the SequeLink Manager Snap-in” on page 83](#) describes how to create and manage server data sources with the SequeLink Manager Snap-in.
- [Chapter 5 “Managing Data Access Activity Using the SequeLink Manager Snap-in” on page 89](#) describes the tasks that you perform to manage and monitor SequeLink service activity using the SequeLink Manager Snap-in.
- [Chapter 6 “Using SequeLink Manager Commands” on page 97](#) describes how to use the SequeLink Manager Command-Line Tool, issue SequeLink Manager commands, and lists some commonly used SequeLink Manager commands.
- [Chapter 7 “Using the SequeLink Manager for OS/390” on page 111](#) describes how to use the SequeLink Manager for OS/390.
- [Chapter 8 “Configuring SequeLink Services Using the SequeLink Manager for OS/390” on page 125](#) describes the tasks that you may need to perform to configure and manage SequeLink Server for OS/390 services locally from an OS/390 machine.

Part 2: Configuring and Managing SequeLink Clients

- [Chapter 9 “Configuring the SequeLink ODBC Client” on page 177](#) describes the tasks that you may need to perform to configure and manage the SequeLink ODBC Client.
- [Chapter 10 “Configuring the SequeLink ADO Client” on page 203](#) describes the tasks that you may need to perform to configure and manage the SequeLink ADO Client.
- [Chapter 11 “Configuring the SequeLink Java Client” on page 227](#) describes the tasks that you may need to perform to configure and manage the SequeLink Java Client.

Part 3: Using SequeLink Security

- [Chapter 12 “Configuring SequeLink Security” on page 241](#) offers an overview of SequeLink security options and describes how to configure SequeLink security for Windows, UNIX, and OS/390 platforms.
- [Chapter 13 “Configuring the SequeLink Proxy Server” on page 273](#) describes how to configure SequeLink security for Java environments.

Part 4: Appendixes

- [Appendix A “Using LDAP with SequeLink ODBC and ADO Clients” on page 305](#) explains how SequeLink Clients use LDAP directories to retrieve connection information and describes how to create and update LDAP entries for SequeLink services.
- [Appendix B “SequeLink Manager Commands” on page 309](#) lists all available SequeLink Manager commands.
- [Appendix C “Operator Interface Commands for OS/390” on page 347](#) lists all available Operator Interface commands by category.

- [Appendix D “SequeLink Service Attributes” on page 361](#) lists the SequeLink Manager attributes you can use to configure and manage your SequeLink environment.
- [Appendix E “SequeLink Events” on page 415](#) lists and defines the SequeLink events, the attributes associated with events, and explains how to write a filter for an event.

NOTE: This book refers the reader to Web URLs for more information about specific topics, including Web URLs not maintained by MERANT. Because it is the nature of Web content to change frequently, MERANT can guarantee only that the URLs referenced in this book were correct at the time of publishing.

SequeLink Documentation

The following documentation is provided on your SequeLink CD in PDF format. You can view the online documentation on the CD using the Acrobat Reader.

The following table provides a guide for finding information in your SequeLink documentation.

For information about...	Go to...
SequeLink concepts and planning your SequeLink environment	<i>Getting Started with SequeLink</i>
Installing the SequeLink middleware components	<i>SequeLink Installation Guide</i>
Administering your SequeLink environment	<i>SequeLink Administrator's Guide</i>

For information about...	Go to...
Developing ODBC, ADO, and JDBC applications for the SequeLink environment	<i>SequeLink Developer's Reference</i>
Troubleshooting and referencing error messages	<i>SequeLink Troubleshooting Guide and Reference</i>

DataDirect product documentation is also available in PDF and HTML formats on the MERANT DataDirect Web site:

<http://www.merant.com/products/datadirect/download/docs/dochome.asp>

Conventions Used in This Book

This section describes the typography, terminology, and other conventions used in this book.

Typographical Conventions

This book uses the following typographical conventions:

Convention	Explanation
<i>italics</i>	Introduces new terms that you may not be familiar with, and is used occasionally for emphasis.
bold	Emphasizes important information. Also indicates button, menu, and icon names on which you can act. For example, click Next .

Convention	Explanation
UPPERCASE	Indicates the name of a file. For operating environments that use case-sensitive filenames, the correct capitalization is used in information specific to those environments. Also indicates keys or key combinations that you can use. For example, press the ENTER key.
<code>monospace</code>	Indicates syntax examples, values that you specify, or results that you receive.
<i>monospaced italics</i>	Indicates names that are placeholders for values you specify; for example, <i>filename</i> .
forward slash /	Separates menus and their associated commands. For example, Select File / Copy means to select Copy from the File menu.
vertical rule	Indicates an OR separator to delineate items.
brackets []	Indicates optional items. For example, in the following statement: SELECT [DISTINCT], DISTINCT is an optional keyword.
braces { }	Indicates that you must select one item. For example, {yes no} means you must specify either yes or no.
ellipsis . . .	Indicates that the immediately preceding item can be repeated any number of times in succession. An ellipsis following a closing bracket indicates that all information in that unit can be repeated.

Mouse Conventions

This action...	Means to...
Click	Point to an object with the mouse pointer and press the left mouse button.
Double-click	Click the left mouse button twice.

This action...	Means to...
Right-click	Click the right mouse button.
Drag	Press and hold the left mouse button while dragging item(s) to another part of the screen.
SHIFT+Click	Press and hold the SHIFT key; then click a selection. This lets you select a series of objects.
CTRL+Click	Press and hold the CTRL key; then click a selection. This lets you select objects randomly.

Keyboard Conventions

Select menu items by using the mouse or pressing ALT+ the key letter of the menu name or item.

Environment-Specific Information

This book supports users of various operating environments. Where it provides information that does not apply to all supported environments, the following symbols are used to identify that information.

Symbol Environment



Windows. Information specific to the Microsoft Windows 95, Windows 98, Windows ME, Windows NT, and Windows 2000 environments is identified by the Windows symbol.



Windows NT. Information specific to the Microsoft Windows NT environment is identified by the Windows symbol and the letters "NT."

Symbol	Environment
	Windows 2000. Information specific to the Microsoft Windows 2000 environment is identified by the Windows symbol and the number “2000”.
	<i>UNIX</i> . Information specific to UNIX environments is identified by this symbol, which applies to all supported UNIX environments. UNIX is a registered trademark in the United States and other countries, licensed exclusively through X/Open Company Ltd.
OS/390	<i>OS/390</i> . Information specific to OS/390 environments is identified by the letters OS/390.

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If you do not want to print each of these online books, you can order hard-copy versions from MERANT. To order, please complete the following order form and fax your request to MERANT at (919) 461-4526.

Contacting Technical Support

MERANT provides technical support for all registered users of SequeLink, including limited installation support, for the first 30 days. For support after that time, contact us using one of the following methods or purchase further support by enrolling in the SupportNet program. For more information about SupportNet, contact your sales representative.

The MERANT Web site provides the latest support information through SupportNet Online, our global service network that provides access to valuable tools and information. Our SupportNet users access information using the Web, automatic email notification, newsgroups, and regional user groups. SupportNet Online includes a knowledge base that allows you to search on keywords for technical bulletins and other information. You also can download product fixes for your DataDirect products.

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Fax International	+32 (0) 15 32 09 19
Mail	1500 Perimeter Park Drive, Suite 100, Morrisville, NC 27560 USA

When you contact us, please provide the following information:

- The **product serial number** located on the Product Registration Information card or on a product serial number card in your package. The number will be checked to verify your support eligibility. If you do not have a SupportNet contract, we will ask you to speak with a sales representative.
- Your **name and organization**. For a first-time call, you may be asked for full customer information, including location and contact details.
- The **version number** of your DataDirect product.
- The type and version of your **operating system**.
- Any **third-party software or other environment information** required to understand the problem.
- A **brief description of the problem**, including any error messages that you have received, **and the steps preceding the occurrence of the problem**. Depending on the complexity of the problem, you may be asked to submit an example so that we can recreate the problem.
- An assessment of the **severity level** of the problem.

1 Introduction

This chapter introduces some concepts to help you understand how to configure and manage your SequeLink environment. For a complete discussion of planning issues, including configuration, administration, and migration issues, refer to *Getting Started with SequeLink*.

SequeLink Server System Administration

SequeLink provides the following options for configuring and managing your SequeLink environment:

- **Local system administration** allows you to configure and manage your SequeLink environment using the SequeLink Manager installed locally on a SequeLink Server.
- **Remote system administration** allows you to configure and manage your SequeLink environment using the SequeLink Manager installed on the desktop of a networked client.

NOTE: Only SequeLink 5.1 services can be configured, managed, or monitored with the SequeLink Manager 5.1.

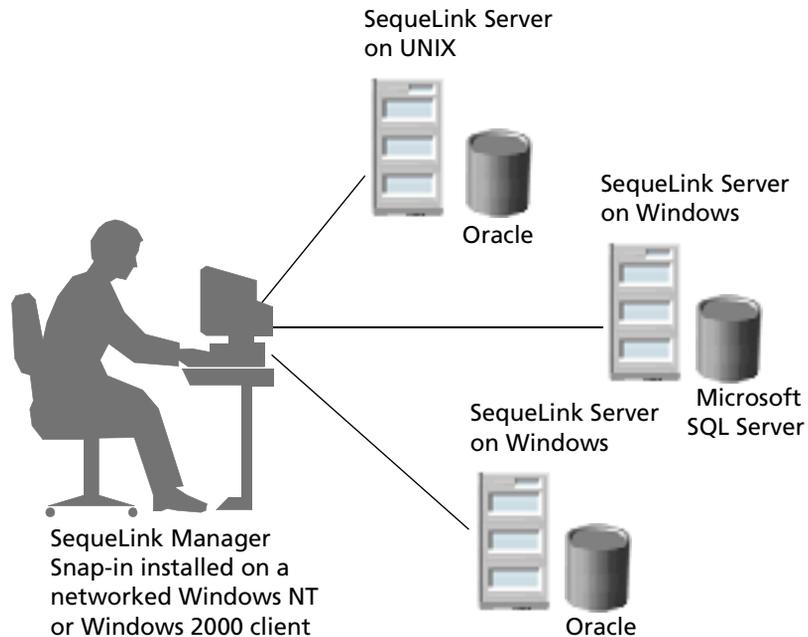
Local System Administration

You can use the SequeLink Manager locally from the SequeLink Server to configure and manage your SequeLink environment; however, the SequeLink Manager tool you can use locally depends on the platform of the SequeLink Server.

Remote System Administration

Remote system administration allows you to configure and manage your data access environment from the convenience of your desktop regardless of your SequeLink Server platform. For example, suppose you are responsible for administering an environment with distributed data access involving a variety of data stores across your enterprise, such as Oracle on UNIX and Windows, and Microsoft SQL Server on Windows as shown in [Figure 1-1](#). You can install the SequeLink Manager Snap-in on a Windows NT or Windows 2000 networked client and perform administration tasks, such as configuring SequeLink service settings, from the convenience of your desktop.

Figure 1-1. Remote System Administration for Data Access Environments



Using the SequeLink Manager

The SequeLink Manager tool can be used to perform administrative and monitoring requests.

Administrative Requests

The type of administrative requests you can issue to a SequeLink Agent, and the SequeLink Manager tool you can use to issue the requests, depends on the platform you are administering—Windows, UNIX, or OS/390. The following list describes the types of administrative requests you can issue:

■ Configuration

- Creating and managing SequeLink services
- Creating and managing SequeLink server data sources
- Configuring monitoring profiles, which determines the data access events that can be monitored (viewed) using the SequeLink Manager
- Configuring event tracing profiles, which determines the data access events that are written to an event trace file

■ Management

- On Windows and UNIX only: Starting and stopping SequeLink services
- Stopping active data access user sessions
- Reviewing traced events to analyze a problem during an earlier data access activity

Monitoring Requests

The SequeLink Manager allows you to perform the following monitoring tasks:

- Viewing details about active services
- Viewing active user sessions and information about "live" data access activities

For example, you can easily view how many transactions have been processed or how many rows have been fetched by all user sessions. Also, if a user session is not performing correctly (such as the session keeps fetching thousands and thousands of rows), you can use the SequeLink Manager to identify and end that specific user session.

Additionally, the SequeLink Manager allows you to troubleshoot previous events. For example, if an error occurs during a nightly data processing job, you can look at an "event trace" to troubleshoot the problem.

SequeLink Manager Implementations

SequeLink provides the following implementations of the SequeLink Manager:

- **SequeLink Manager Snap-in** is a GUI designed as a snap-in to the Microsoft Management Console (MMC). It can be used to configure and manage SequeLink services on Windows and UNIX platforms. It can be used to monitor data access activity on Windows, UNIX, and OS/390 platforms.
- **SequeLink Manager Command-Line Tool** is a command-line interface that can be used to configure and manage SequeLink services on Windows and UNIX platforms. Similarly, it can be used to monitor data access activity on Windows and UNIX platforms.

- **SequeLink Manager for OS/390** is an ISPF dialog tool that can be used to configure and manage SequeLink services on the OS/390 platform, as well as monitor data access activity on the OS/390 platform. It can be installed only on OS/390 platforms.

[Table 1-1](#) shows the platforms on which you can install and run the different implementations of the SequeLink Manager.

Table 1-1. Platforms on which the SequeLink Manager Tools can be Installed

SequeLink Manager	Win NT/ 2000	UNIX	OS/390
SequeLink Manager Snap-in	✓		
SequeLink Manager Command-Line Tool	✓	✓	
SequeLink Manager for OS/390			✓

NOTE: Only SequeLink 5.1 services can be configured, managed, or monitored with the SequeLink Manager 5.1.

About SequeLink Services

SequeLink Server installs the following server software service components to provide data connectivity, performance, and administration for two-tier client/server and *n*-tier web/application server environments:

- **SequeLink data access services** handle data access requests from any SequeLink Client. Multiple SequeLink data access services can run on the same SequeLink Server. For example, SequeLink Server for Oracle and SequeLink Server for Microsoft SQL Server can run side-by-side on the same machine.
- **SequeLink Agent services** carry out configuration, management, and monitoring requests from any SequeLink Manager. The SequeLink Agent can service multiple SequeLink services on the same SequeLink Server.

When you complete the installation of the SequeLink Server software as documented in the *SequeLink Installation Guide*, a SequeLink data access service is configured for the type of SequeLink Server you installed (for example, SequeLink Server for Oracle). In addition, a SequeLink Agent is configured to handle configuration, management, and monitoring requests from any SequeLink Manager.

SequeLink Service Attributes

When a client application connects to a SequeLink data access service using a SequeLink Client, the data access functionality of the session is governed by a set of service attributes for the SequeLink data access service. Service attributes also include attributes defined for server data sources associated with the SequeLink service. For example, if you set `DataSourceReadOnly=`

Select, the client application will only be able to perform Select statements when using that service.

NOTES:

- SequeLink service attributes beginning with "DataSource", such as DataSourceReadOnly, are server data source attributes.
- SequeLink Agent services do not have server data source attributes.

When you create a SequeLink service, only commonly used service attributes are included in the default configuration of a SequeLink service. To configure other attributes, you must add that attribute explicitly to your SequeLink configuration. You configure SequeLink services and their attributes using the SequeLink Manager.

SequeLink service attributes are static or dynamic:

- **Static attributes** require you to restart a SequeLink service when you add or change the attribute before the change becomes effective.
- **Dynamic attributes** become effective after the attribute is added or changed and the configuration is saved. Most dynamic attributes affect the behavior of a database connection; therefore, when you add or change an attribute, the new values are used for the next connection, active connections do not use the new values.

NOTE: Server data source attributes are always dynamic.

See ["Server Data Sources" on page 37](#) for more information about server data sources. See [Appendix D "SequeLink Service Attributes" on page 361](#) for a complete list of SequeLink service attributes, including server data source attributes, and for information about whether they are static or dynamic.

SequeLink Service Templates

When you install SequeLink Server, at least one SequeLink data access service is installed using default attributes for that service. Default service attributes are defined in the SequeLink service templates. Using the SequeLink Manager, you can create additional services based on any of the following SequeLink service templates:

- [SequeLink 5.1] Agent service
- [SequeLink 5.1] DB2 service for OS/390
- [SequeLink 5.1] DB2 Universal Database service
- [SequeLink 5.1] Informix service
- [SequeLink 5.1] Oracle 7.3 service
- [SequeLink 5.1] Oracle 8.0 service
- [SequeLink 5.1] Oracle 8.1 service
- [SequeLink 5.1] SQL Server service
- [SequeLink 5.1] Sybase service

Monitoring SequeLink Service Activity

SequeLink can monitor services, sessions, statements, and data access events. To configure what you want SequeLink to monitor, you can use the SequeLink Manager. For information about setting monitoring profiles using the:

- SequeLink Manager Snap-in, see [Chapter 3 “Configuring SequeLink Services Using the SequeLink Manager Snap-in”](#) on page 61.
- SequeLink Manager Command-Line Tool, see [Chapter 6 “Using SequeLink Manager Commands”](#) on page 97.
- SequeLink Manager for OS/390, see [Chapter 8 “Configuring SequeLink Services Using the SequeLink Manager for OS/390”](#) on page 125.

You can integrate SequeLink monitoring with the Windows NT Performance Monitor tool, which allows you to access monitoring information from this Windows NT tool. See [“Integrating SequeLink Monitoring with the Windows NT Performance Tool”](#) on page 81 for instructions on integrating SequeLink monitoring with the Windows NT Performance Monitor tool.

Event Handling

Each data access activity that occurs between the client application and the data store causes an event to be generated. Depending on which SequeLink profiles are active, the information generated with the event is displayed as it occurs on the runtime monitor and stored in a file called the *event trace file*. By default, the event trace file is located in the *installdir/tracing* directory, where *installdir* is your SequeLink Server installation directory.

By setting profiles that control which events are traced in the SequeLink service configuration, you can inspect specific information generated by these events. Event tracing allows you to monitor ongoing activity, troubleshoot problems, and fine-tune your data access infrastructure. For example, if you wanted to monitor the number of transactions a SequeLink Server processes for capacity planning purposes, you could set a profile in the SequeLink service configuration that returned only that information. In addition, the information stored in the event trace file is persisted, which means that you can inspect the information at a later time.

As a SequeLink data access service runs and processes data access requests, it generates events that are identified by:

- An event ID
- The service in which the event occurred
- The time the event occurred
- List of attributes and their values

Examples of information that can be monitored and traced are SQL statements, number of transactions, failures, and authentication information.

For instructions on configuring the events to be monitored and traced by the SequeLink Manager, see [“Configuring Event Tracing” on page 76](#).

About Data Sources

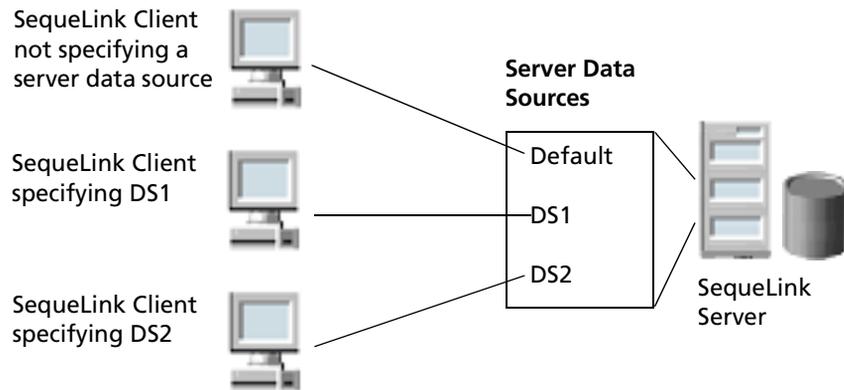
SequeLink uses two types of data sources—server data sources and client data sources.

Server Data Sources

Server data sources are data sources configured on the SequeLink Server that contain settings that affect how the SequeLink service operates and settings that affect how data is accessed by SequeLink Clients. Centralizing this information on the server, instead of distributing it among hundreds of SequeLink Clients, provides easier management of your entire data access infrastructure. When you install SequeLink Server, a default server data source, named *Default*, is automatically created on the server. If necessary, you can modify the definition of the default server data source.

If you do not specify a server data source for the connection when you configure the SequeLink Client, the attributes of the Default server data source govern the data access functionality of the connection. For example, if you configured two server data sources named DS1 and DS2 as shown in [Figure 1-2](#), and configured a SequeLink Client that did not specify a particular server data source, the data access functionality of the connection between the SequeLink Client and the SequeLink Server would be governed by the Default server data source.

Figure 1-2. SequeLink Clients Specifying Server Data Sources



For instructions on configuring server data sources using the:

- SequeLink Manager Snap-in, see [Chapter 4 “Configuring Server Data Sources Using the SequeLink Manager Snap-in”](#) on page 83.
- SequeLink Manager Command-Line Tool, see [Chapter 6 “Using SequeLink Manager Commands”](#) on page 97.
- SequeLink Manager for OS/390, see [Chapter 8 “Configuring SequeLink Services Using the SequeLink Manager for OS/390”](#) on page 125.

Client Data Sources

Client data sources are minimal data sources configured on the SequeLink Client that contain connection instructions to a SequeLink data access service. Client data sources are required when configuring the SequeLink ODBC Client or the SequeLink ADO Client. For SequeLink Java Clients, you can configure a client data source or a connection URL.

For instructions on configuring client data sources for the SequeLink ODBC Client and SequeLink ADO Client, see:

- [Chapter 9 “Configuring the SequeLink ODBC Client” on page 177.](#)
- [Chapter 10 “Configuring the SequeLink ADO Client” on page 203.](#)

For instructions on specifying connection URLs for SequeLink Java Clients, see [“Specifying SequeLink JDBC Driver Connection URLs” on page 227](#). Configuring JDBC client data sources is considered an advanced topic. For instructions on configuring JDBC client data sources for the SequeLink Java Client, refer to the *SequeLink Developer’s Reference*.



Synchronizing ODBC and ADO Client Data Sources

On Windows platforms, you can use the SequeLink Data Source SyncTool to create ODBC or ADO data source files containing collections of client data source definitions that can be distributed easily to hundreds of SequeLink Clients. The SequeLink Data Source SyncTool has two different user implementations—one for the SequeLink administrator and another for the end user. The end user simply imports these client data source definitions from the distributed data source file using the end user implementation of the SequeLink Data Source SyncTool.

For instructions on exporting and importing ODBC and ADO client data source definitions to data source files, see:

- [“Importing and Exporting ODBC Client Data Sources” on page 198.](#)
- [“Importing and Exporting ADO Client Data Sources” on page 223.](#)

In addition, you can create a customized, installable image of SequeLink ODBC Client or SequeLink ADO Client called a *Quick Install image* that contains predefined settings, including data source files created with the SequeLink Data Source SyncTool. Quick Install images can be distributed to and installed on each client in your workgroup. When installed, any data sources in the specified data source file are configured on the workstation automatically. Using Quick Install images allows you to install a consistent, fully configured SequeLink Client installation on every workstation. For instructions on creating Quick Install images for SequeLink ODBC Clients and SequeLink ADO Clients, refer to the *SequeLink Installation Guide*.

Choosing a SequeLink Connection Model

The type of connection model you choose for your SequeLink configuration partly depends on your SequeLink Server platform and whether you are using the distributed transaction functionality of a DBMS. SequeLink provides the following types of connection models:

- The **ThreadPool** connection model starts SequeLink with a preallocated minimum number and maximum number of threads that can be shared by multiple SequeLink Clients connected to the SequeLink Server. It provides optimum scalability—many client connections can be serviced with the same system resources on the server. It is the default connection model for all platforms except OS/390; the ThreadPool connection model cannot be used on OS/390.



NOTE: If you are using distributed transactions with DB2 Universal Database on Windows or UNIX platforms, do not use the ThreadPool connection model; use the Process/Connection model.

For information about how the `ServiceMinThreads`, `ServiceMaxThreads`, `DataSourceThreadMaxRpc`, and `DataSourceThreadRpcTimeOut` service attributes govern how the threadpool engine operates, see [“Allocating the Number of Threads in the Thread Pool” on page 41](#) and [“Returning Threads to the Thread Pool” on page 42](#).

- The **Process/Connection** connection model creates a separate operating system task for each SequeLink Client connection request. This is the only connection model supported on OS/390.



NOTE: If you are using distributed transactions with DB2 Universal Database on Windows or UNIX platforms, use the **Process/Connection** model.

- The **Thread/Connection** connection model provides a dedicated thread for each SequeLink Client connection to a SequeLink Server. Use the **Thread/Connection** connection model for client applications that are database-intensive, such as bulk load or bulk transfer applications.

Allocating the Number of Threads in the Thread Pool

SequeLink can accommodate both low and high user activity by using a minimum number of pre-started threads in the thread pool that can be dynamically increased to accommodate peak user activity. When the SequeLink Server is started, the number of threads specified by `ServiceMinThreads` will populate the thread pool to wait for data access requests from SequeLink Clients. If, during the working day, frequent user activity causes the number of threads specified by `ServiceMinThreads` to be active concurrently, SequeLink Server will dynamically create additional threads up to the number specified by `ServiceMaxThreads`.

Returning Threads to the Thread Pool

SequeLink allows you to accommodate idle periods and heavy workload traffic by setting attributes that govern when threads are returned to the thread pool.

`DataSourceThreadMaxRpc` specifies the maximum number of connection requests that will be accepted before the thread allocated to the connection is returned to the thread pool. For example, if `DataSourceThreadMaxRpc` is set to 10, the thread will not be returned to the thread pool until after 10 connection requests have been made.

The `DataSourceThreadRpcTimeOut` attribute ensures that, under heavy workload conditions that might cause all threads to be active concurrently, the SequeLink Server can still process additional client data access requests.

`DataSourceThreadRpcTimeOut` specifies the maximum number of requests the thread will service before it is returned to the thread pool where the thread can be reallocated to serve other SequeLink Clients.

Part 1: Configuring and Managing SequeLink Services

This part contains the following chapters:

- [Chapter 2 “Using the SequeLink Manager Snap-in” on page 45](#) describes how to use the SequeLink Manager MMC Snap-In.
- [Chapter 3 “Configuring SequeLink Services Using the SequeLink Manager Snap-in” on page 61](#) describes how to create and manage SequeLink services with the SequeLink Manager MMC Snap-In.
- [Chapter 4 “Configuring Server Data Sources Using the SequeLink Manager Snap-in” on page 83](#) describes how to create and manage server data sources with the SequeLink Manager MMC Snap-In.
- [Chapter 5 “Managing Data Access Activity Using the SequeLink Manager Snap-in” on page 89](#) describes the tasks that you perform to manage and monitor SequeLink service activity using the SequeLink Manager MMC Snap-In.
- [Chapter 6 “Using SequeLink Manager Commands” on page 97](#) describes how to use the SequeLink Manager Command-Line Tool, issue SequeLink Manager commands, and lists some commonly used SequeLink Manager commands.
- [Chapter 7 “Using the SequeLink Manager for OS/390” on page 111](#) describes how to use the SequeLink Manager for OS/390.
- [Chapter 8 “Configuring SequeLink Services Using the SequeLink Manager for OS/390” on page 125](#) describes the tasks that you may need to perform to configure and

manage SequeLink Server for OS/390 services locally from an OS/390 machine.

2 Using the SequeLink Manager Snap-in



On Windows NT and Windows 2000, you can use the SequeLink Manager Snap-in to configure, manage, and monitor your SequeLink environment on the same machine or on a remote networked machine. The SequeLink Manager Snap-in is designed as a snap-in tool to the Microsoft Management Console (MMC). This chapter describes how to use the SequeLink Manager Snap-in. See [“SequeLink Server System Administration” on page 27](#) for more information about the SequeLink Manager.

OS/390 NOTE: To configure and manage SequeLink services on OS/390 or to create OS/390-specific core entities such as DB2 interfaces, use the SequeLink Manager for OS/390. See [Chapter 8 “Configuring SequeLink Services Using the SequeLink Manager for OS/390” on page 125](#). Monitoring can be performed using any SequeLink Manager.

Adding the SequeLink Manager Snap-in to the MMC

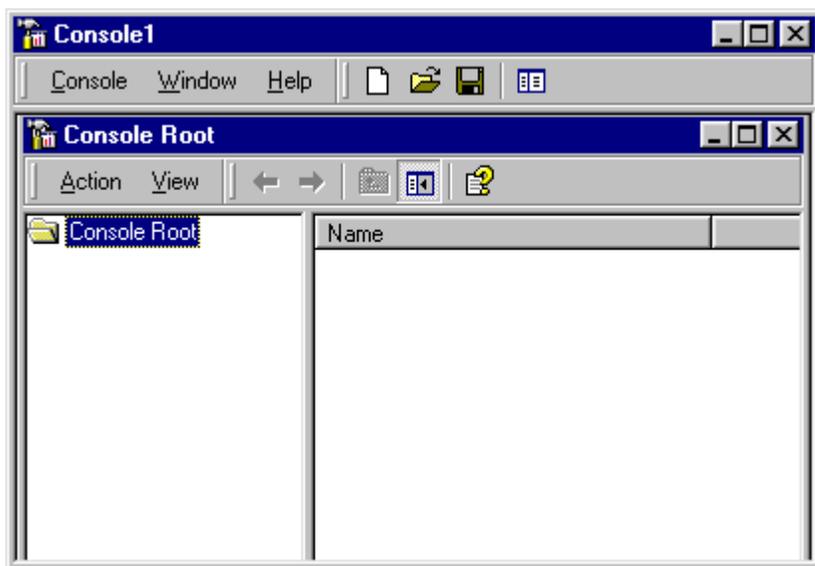
Before you can use the SequeLink Manager Snap-in to administer a remote SequeLink Server, you must add it to the MMC. You do not need to add the SequeLink Manager Snap-in to the MMC if you are administering a local SequeLink Server because a default .MSC file, which defines the local SequeLink Manager configuration, is installed when you install SequeLink Server. For local administration, you can simply open the .MSC file in the MMC. The default .MSC file is named `sladmin51.msc`

and is installed in the *installdir*\admin directory, where *installdir* is your SequeLink Server installation directory (for example, \Program Files\Merant\slserver51\admin).

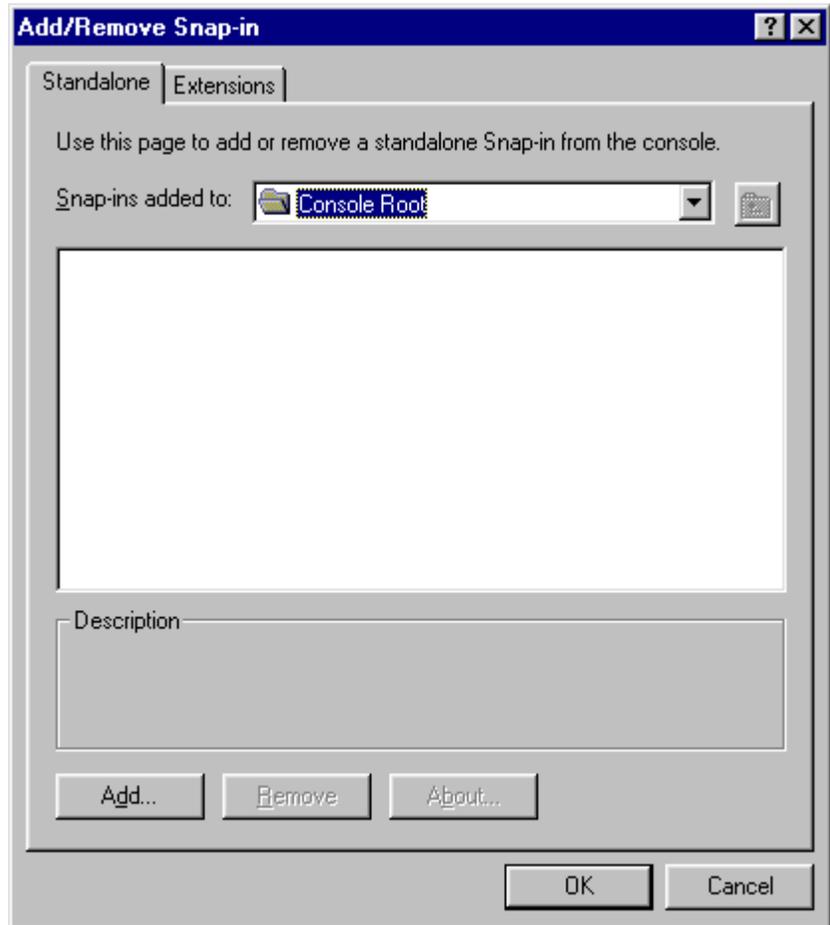
When you add the SequeLink Manager Snap-in to the MMC, you must choose a configuration option that connects you to a SequeLink Agent on the same machine or connects you to a SequeLink Agent on another machine. Once you have added the configuration to the MMC, you can save the configuration in an .MSC file.

To add the SequeLink Manager Snap-in to the MMC:

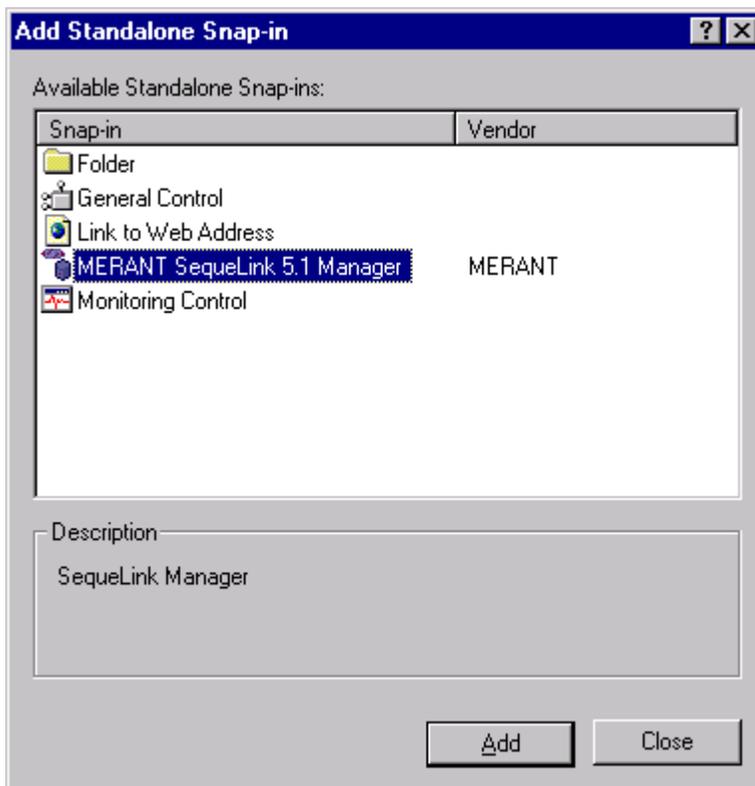
- 1 Start the MMC. Select **Start / Run** and type **mmc** in the Open field; then, click **OK**. An MMC console window appears.



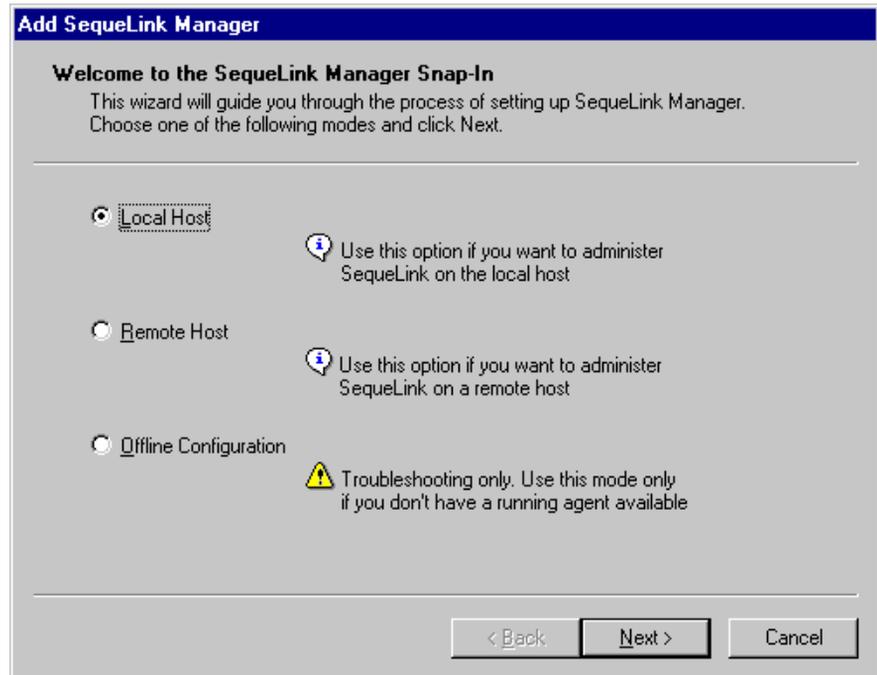
- 2 From the MMC toolbar, select **Console / Add/Remove Snap-in**. The Add/Remove Snap-in window appears.



- 3 Click the **Add** button. The Add Standalone Snap-in window appears.



- 4 From the Available Standalone Snap-ins list, select the **MERANT SequeLink 5.1 Manager**, and click the **Add** button. The Add SequeLink Manager window appears.



- 5 Choose one of the following SequeLink Manager configuration options:
- Choose the **Local Host** option to configure and manage SequeLink services on the same machine. Continue with ["Local Host Configuration" on page 50](#).
 - Choose the **Remote Host** option to configure and manage SequeLink services on another machine. Continue with ["Remote Host Configuration" on page 52](#).
 - Choose the **Offline Configuration** option to open the local configuration file in offline mode. You must specify the local configuration file in the Configuration File field. The local configuration file is *install\dir\cfg\swandm.ini*

where *installdir* is the SequeLink Server installation directory.

IMPORTANT: Only use this option when instructed to do so by MERANT technical support.

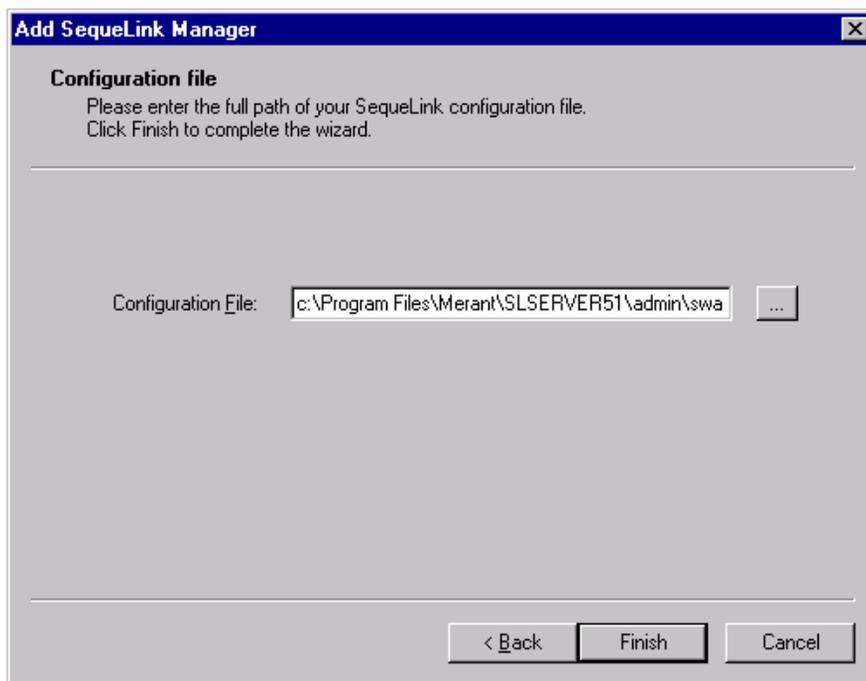
Local Host Configuration

- 1 On the Add SequeLink Manager window, select the **Local Host** option; then, click **Next**.



- 2 The Local window appears showing the location and name of the local configuration file in the Configuration File field. The local configuration file defines SequeLink Server configuration information such as SequeLink services, server data sources, and profiles.

NOTE: The default local configuration file is *installdir*\admin\swandm.ini where *installdir* is the SequeLink Server installation directory.



Click **Finish**. The SequeLink Manager is added to the MMC.

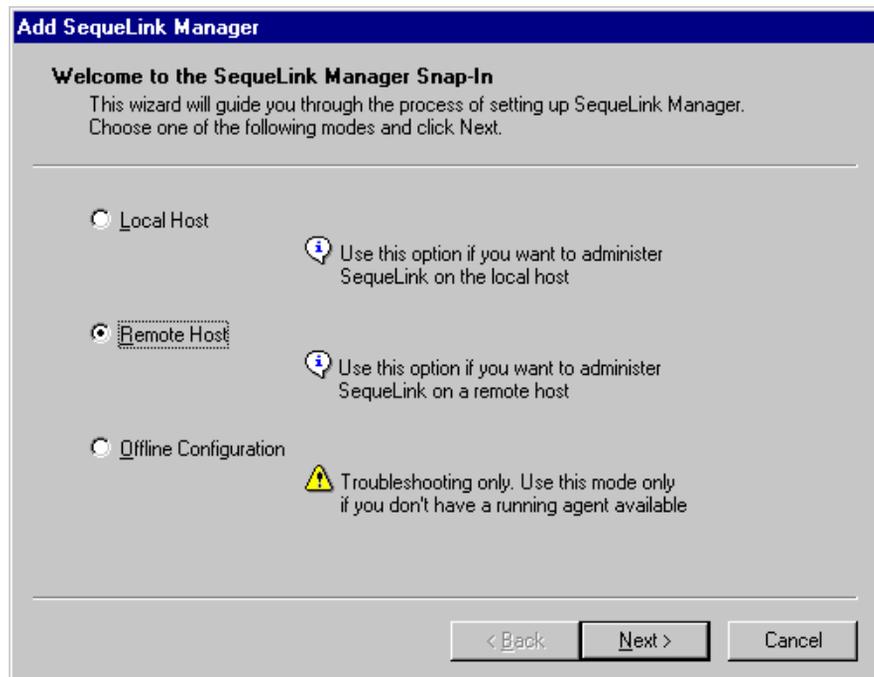
You can now use the SequeLink Manager to configure and manage SequeLink services on the same machine.

- 3 To save the SequeLink Manager Snap-in to an MMC file (.MCS), select **Console / Save** from the MMC console window.

Remote Host Configuration

IMPORTANT: Before you can add the SequeLink Manager Snap-in to the MMC as a remote host configuration, make sure that the SequeLink Agent is active on the remote host.

- 1 On the Add SequeLink Manager window, select the **Remote Host** option. Then, click **Next**.



2 The Add SequeLink Manager window appears.

Add SequeLink Manager

SequeLink Agent
Please enter the connection information to your SequeLink Agent.
Click Finish to complete the wizard.

Specify the host on which your SequeLink Agent is running.
The host can be specified by either the host name or the host address.

Host:

The port is the TCP port on which your SequeLink Agent is listening.
The TCP port must be in the range 1024 to 65534.

TCP Port:

< Back Finish Cancel

Perform the following actions:

- a In the Host field, type the host name of the remote server.
- b In the TCP port field, type the TCP/IP port the SequeLink Agent is listening on for connection requests. The port you specify must be the same as the one that was specified for the SequeLink Agent service when the SequeLink Server was installed; the default is 1995.
- c Click **Finish**. The SequeLink Manager is added to the MMC.

You can now use the SequeLink Manager to configure and manage SequeLink services on another machine.

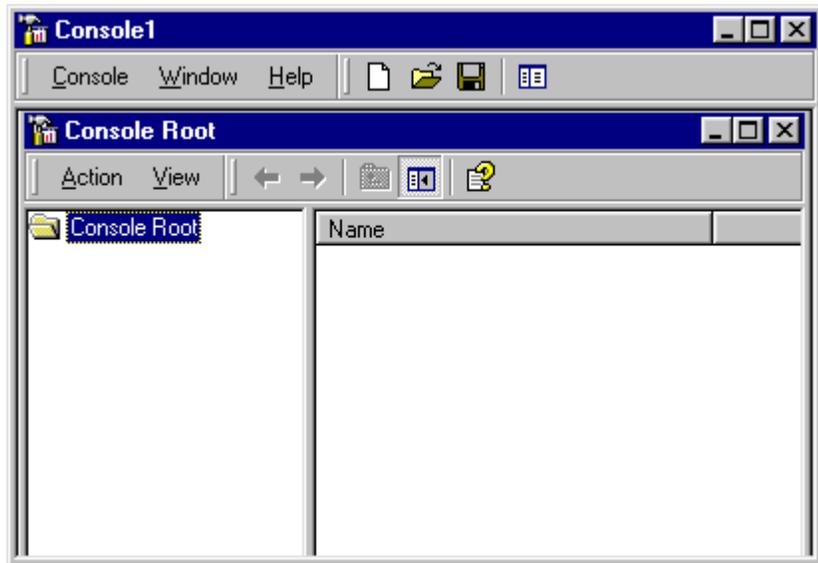
- 3 To save the SequeLink Manager Snap-in to an MMC file (.MCS), select **Console / Save** from the MMC console window.

Starting the SequeLink Manager Snap-in

Before you can use the SequeLink Manager Snap-in to administer a remote SequeLink Server, you must add the SequeLink Manager Snap-in to the MMC. For instructions on adding the SequeLink Manager Snap-in to the MMC, see [“Adding the SequeLink Manager Snap-in to the MMC” on page 45](#).

To start the SequeLink Manager Snap-in:

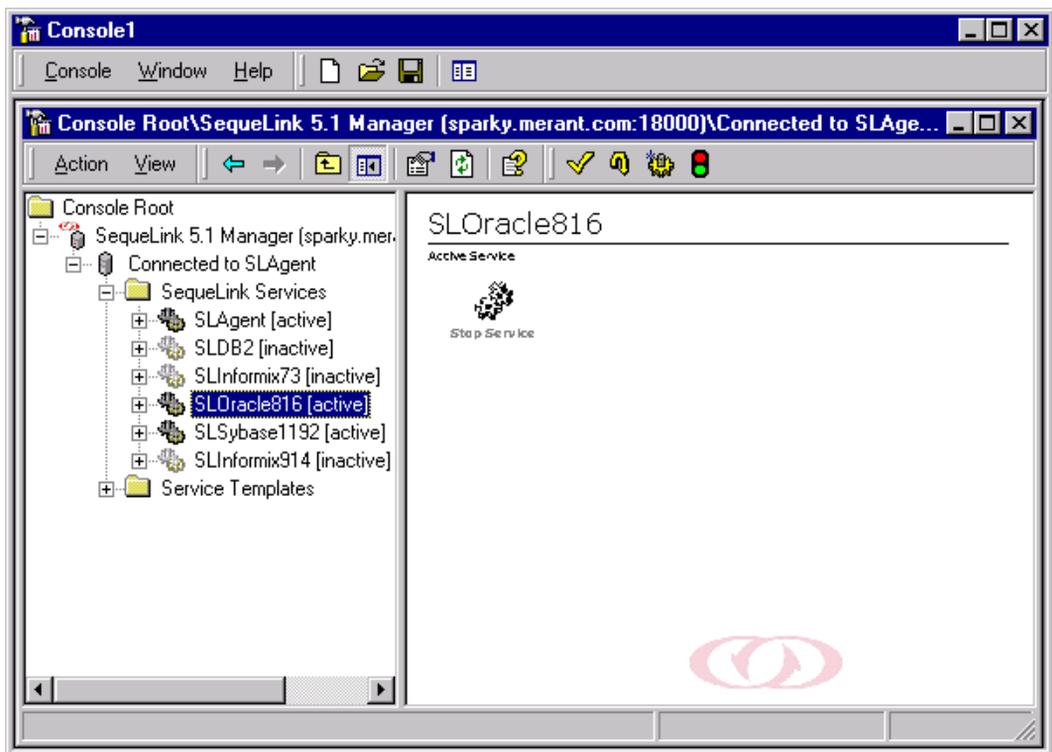
- 1 Click **Start / Run**. Type `mmc` in the Run field, and click **OK**. An MMC console window appears.



- 2 From the Console menu, select **Console / Open**. Select the SequeLink Manager console you want to start. Then, click **Open**.

Working with the SequeLink Manager Snap-in

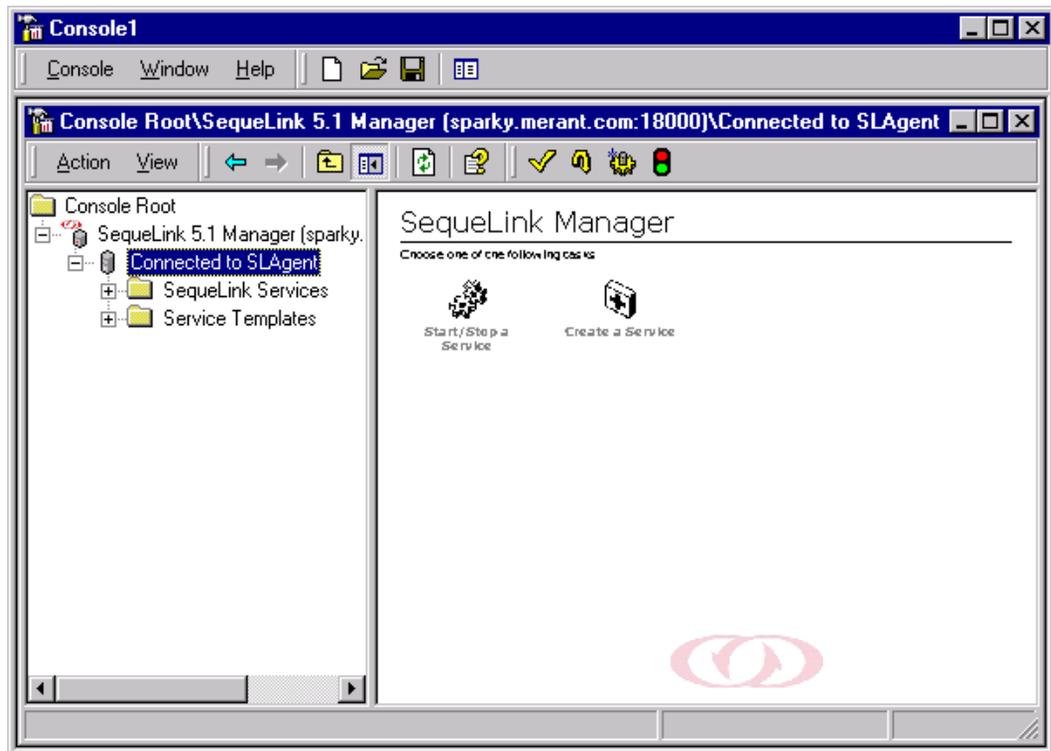
The SequeLink Manager Console window, by default, is divided into two panes. The left pane shows the *console tree*. Each node in the tree represents an item in your SequeLink configuration. You can expand any node in the console tree by double-clicking that node or by single-clicking the + (plus sign) for that node.



When you select an item in the left pane, the right pane (*details pane*) displays information about the item you selected or shows wizards you can use to perform common tasks that affect that item. To use any wizard, click the wizard icon.

Connecting to SequeLink Agents

To view or change information about a local or remote SequeLink service, you must connect to the SequeLink Agent that services that SequeLink service. To connect to a SequeLink Agent, double-click the SequeLink Agent in the left pane. If a user name and password is required to connect to the SequeLink Agent, the SequeLink Manager will prompt you for that information. If prompted for a user name and password, enter the appropriate user name and password in the connection dialog box.



NOTE: This window shows a remote host. A local host displays an additional wizard in the details pane—the Start/Stop the Agent wizard.

Displaying SequeLink Service Attributes

Once you are connected to a SequeLink Agent, you can view the following types of attributes:

- Attributes of the SequeLink Agent service
- Attributes of any SequeLink data access service (active and inactive) serviced by that SequeLink Agent

SequeLink service attributes are logically grouped into the following categories:

- General
- Advanced
- Logging
- Administration Security
- User Security
- Application Security
- Environment
- Installation parameters
- Workarounds

To view the attributes in a specific category, expand the category by double-clicking that node or by single-clicking the + (plus sign) for that node. See [Appendix D “SequeLink Service Attributes” on page 361](#) for a list and description of SequeLink service attributes.

Refreshing Active Information

You can refresh the active information being viewed in the SequeLink Manager Snap-in, such as active sessions or active services, by using the Refresh button on the SequeLink Manager Snap-in toolbar or by turning on the Autorefresh option for the current session.

The Autorefresh option can only be used for the Monitor node (and all its subnodes) and the SequeLink Services node. It allows

you to specify an interval in seconds that the display will automatically refresh.

To turn on the Autorefresh option:

- 1 Select the node you want to turn on the Autorefresh option for, and then, select **View / Autorefresh**.
- 2 Choose one of the following Autorefresh options:
 - Slow** (refreshes every 10 seconds)
 - Normal** (refreshes every 5 seconds)
 - Fast** (refreshes every 2 seconds)
 - Custom** (specify a refresh interval in seconds)

The Autorefresh option is turned off by default and is not saved when you save your configuration to an .MSC file. To turn off the Autofresh option, select **View / Autorefresh**.

Using the SequeLink Manager Snap-in Toolbar

[Table 2-1](#) lists some important elements of the toolbar and describes the actions they allow you to perform.

Table 2-1. SequeLink Manager Snap-in Toolbar

Item	Description				
Console menu	Commands that perform the following actions:				
	<table border="0"> <tr> <td style="padding-right: 20px;">New</td> <td>Creates a new console.</td> </tr> <tr> <td>Open</td> <td>Opens a console.</td> </tr> </table>	New	Creates a new console.	Open	Opens a console.
New	Creates a new console.				
Open	Opens a console.				

Shortcut Tip: Right-clicking on any item in the console tree displays a menu allowing you to perform the same actions that are available from the toolbar.

Table 2-1. SequeLink Manager Snap-in Toolbar (cont.)

Item	Description
	Save Saves changes you make to the current console.
	Save as Saves the current console with another name.
	Add/Remove Snap-in Adds or removes MMC snap-ins to or from the MMC.
	Options Options that affect how the console can be used.
Window menu	Options that affect the console window.
Help menu	Accesses online help for the MMC.
	Creates a new console.
	Opens a console.
	Saves changes to the current console.
	Creates a new window.
Action menu	Commands that perform actions that apply to the object that is selected. For example, if an active SequeLink Service is selected, the Stop command is available.
View menu	Allows you to customize how the console appears. It also allows you to turn on the Autorefresh option for the Monitor nodes and SequeLink Services nodes for the current session.
	Moves back to the last configurable item in the console tree.
	Moves forward to the next configurable item in the console tree.

Shortcut Tip: Right-clicking on any item in the console tree displays a menu allowing you to perform the same actions that are available from the toolbar.

Table 2-1. SequeLink Manager Snap-in Toolbar (cont.)

Item	Description
	Moves up one level in the console tree.
	Shows or hides the console tree.
	Displays the properties of a SequeLink service.
	Deletes an attribute when you select it while a service attribute is selected.
	Refreshes active information in the console tree.
	Accesses online help for the MMC and for the SequeLink Manager Snap-in.
	Saves all modifications to the configuration file.
	Discards all modifications and reverts to the original configuration file.
	Adds a SequeLink data access service.
	Saves changes to the SequeLink configuration.
	Starts and stops SequeLink services.
Shortcut Tip: Right-clicking on any item in the console tree displays a menu allowing you to perform the same actions that are available from the toolbar.	

3 Configuring SequeLink Services Using the SequeLink Manager Snap-in

This chapter describes how to create and manage SequeLink services with the SequeLink Manager Snap-in.

To do this...	See...
Start/stop SequeLink services	"Starting and Stopping SequeLink Services" on page 62
Create a SequeLink service	"Creating a SequeLink Service" on page 63
Delete a SequeLink service	"Deleting a SequeLink Service" on page 66
View service attributes	"Viewing Service Attributes" on page 67
Change a service attribute	"Changing a Service Attribute" on page 68
Add a service attribute	"Adding a Service Attribute" on page 69
Delete a service attribute	"Deleting a Service Attribute" on page 70
Configure monitoring	"Configuring Monitoring" on page 71
Configure event tracing	"Configuring Event Tracing" on page 76

To do this...

Integrate monitoring with Windows NT performance monitoring

See...

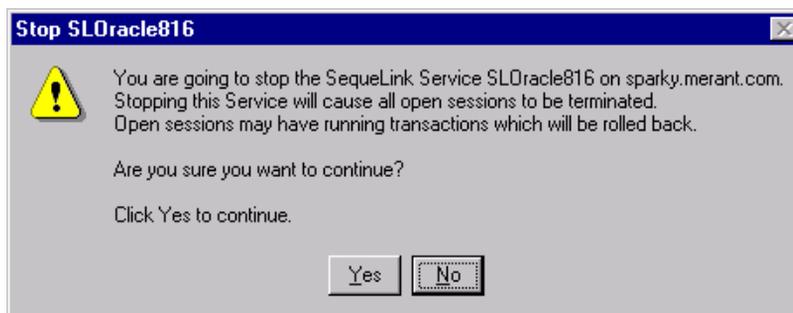
[“Integrating SequeLink Monitoring with the Windows NT Performance Tool” on page 81](#)

- OS/390 NOTE: SequeLink Server DB2 services for OS/390 must be created, started, stopped, and deleted locally using the SequeLink Manager for OS/390. For more information about creating and managing SequeLink services on OS/390, see [Chapter 8 “Configuring SequeLink Services Using the SequeLink Manager for OS/390” on page 125](#).

Starting and Stopping SequeLink Services

NOTE: You can only start and stop the SequeLink Agent locally from the SequeLink Server on which it runs.

- 1 Click the **Stop Service** or **Start Service** wizard in the Details pane. You are prompted to confirm the stopping or starting of the service. The following dialog box shows an example of the message that appears when you stop a service.



- 2 Click the **Yes** button to stop or to start the service.

Creating a SequeLink Service

When you install SequeLink Server, at least one SequeLink data access service is installed using default attributes for that service. Default service attributes are defined in the SequeLink service templates. Using the SequeLink Manager, you can create additional services based on any of the following SequeLink service templates:

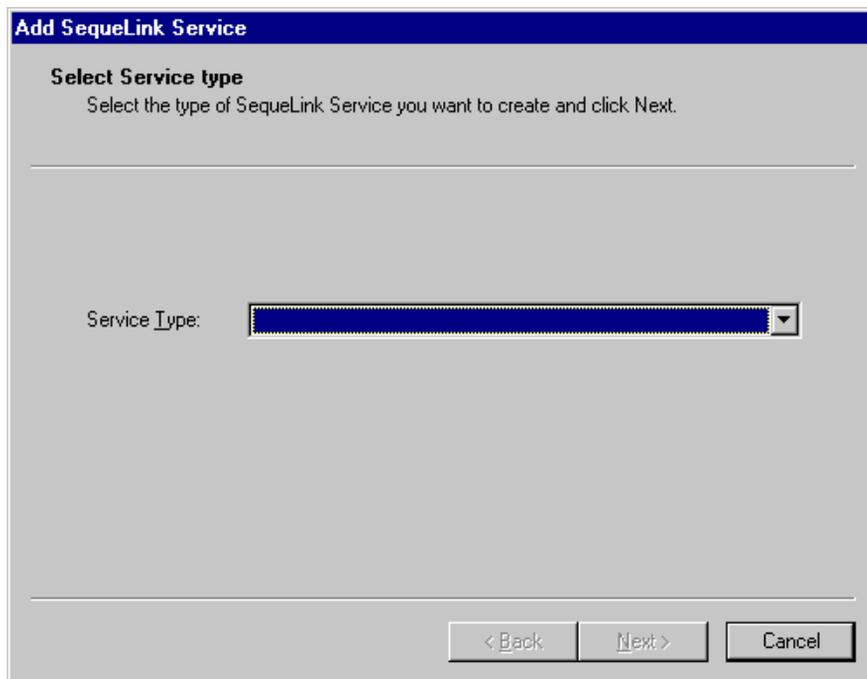
- [SequeLink 5.1] Agent service
- [SequeLink 5.1] DB2 Universal Database service
- [SequeLink 5.1] Informix service
- [SequeLink 5.1] Oracle 7.3 service
- [SequeLink 5.1] Oracle 8.0 service
- [SequeLink 5.1] Oracle 8.1 service
- [SequeLink 5.1] SQL Server service
- [SequeLink 5.1] Sybase service

OS/390 NOTE: SequeLink DB2 services for OS/390 must be created with the SequeLink Manager for OS/390. See [Chapter 8 “Configuring SequeLink Services Using the SequeLink Manager for OS/390”](#).

In most cases, the SequeLink service templates provide a configuration for SequeLink services that can be used without any modification. Not all SequeLink service attributes are defined in the templates. You can modify the templates to fit your needs by adding and deleting attributes, and by changing the values of the attributes. See [Appendix D “SequeLink Service Attributes” on page 361](#) for a list of all SequeLink service attributes.

To create a SequeLink data access service:

- 1 In the console tree, select the SequeLink Agent that will service the new SequeLink data access service.
- 2 In the Details pane, click the **Create a Service** wizard. The wizard prompts you to choose the type of service to create.



From the Service drop-down list, select the type of SequeLink service you want to create; then, click **Next**.

3 The wizard prompts you for service information.

Add SequeLink Service [X]

Service information
Provide a name and a TCP port for your SequeLink Service.

Choose a name for this SequeLink Service. This Service Name must be unique for this SequeLink installation.

Service Name:

Choose a TCP port number for this SequeLink Service. The TCP port must be in the range 1024 to 65534.

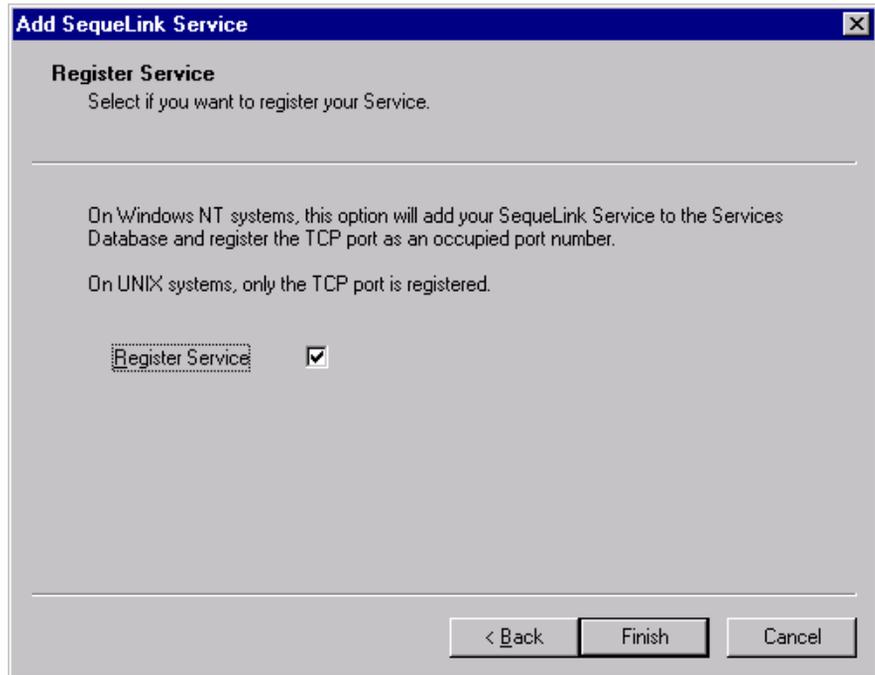
TCP Port:

< Back Next > Cancel

Perform the following actions:

- a In the Service Name field, type the service name you want to use for the new SequeLink service. The service name must be unique (not used by another service).
 - b In the TCP port field, type the number of the TCP/IP port on which the new SequeLink service will be listening. The port must be an available port (cannot be used by another service).
 - c Click **Next**.
- 4 The wizard prompts you to register the SequeLink service on the host machine. The default is to register the service, which makes the service information available to the operating

system. This is required on Windows NT if you want to start your service through the SequeLink Manager or the Service Control Manager.



- 5 Click **Finish** to create the new SequeLink service.

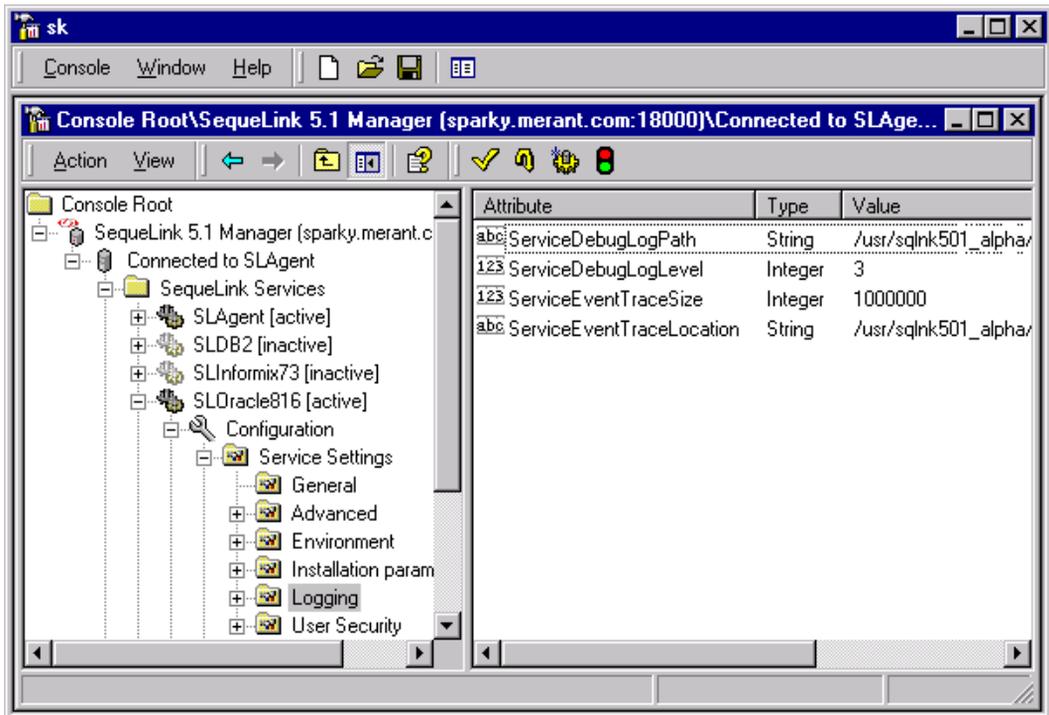
Deleting a SequeLink Service

NOTE: Before deleting a SequeLink service, you must stop the service you want to delete.

- 1 Right-click the SequeLink service you want to delete in the left pane, and select **Delete**.
- 2 You are prompted to confirm the deletion. Click **OK** to confirm. The service is deleted.

Viewing Service Attributes

To view SequeLink service attributes, select an attribute category from the Service Settings node. The Details pane shows all attributes in that category and their current values. For example, if you select the Logging attribute category, the settings display in the Details pane.



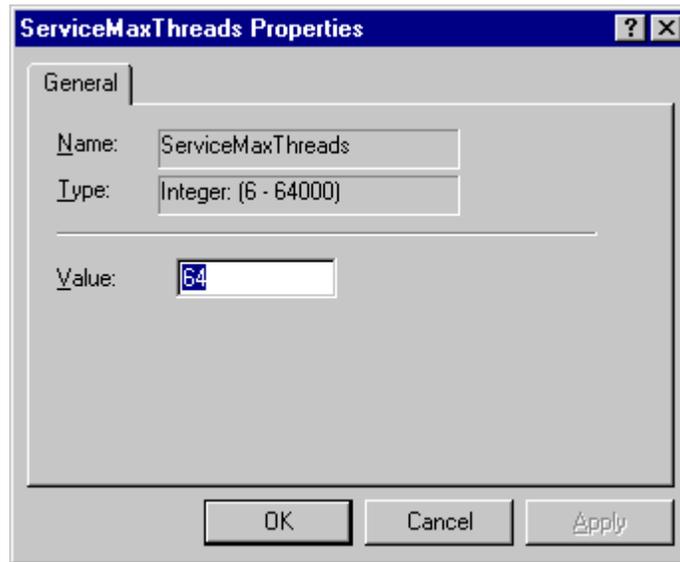
NOTE: Only commonly used attributes are included in the configuration of a newly created SequeLink service. To configure other attributes, you must add the attribute explicitly to your SequeLink configuration.

For a description of SequeLink service attributes, see [Appendix D "SequeLink Service Attributes"](#) on page 361.

Changing a Service Attribute

- 1 Right-click any SequeLink service attribute and select **Properties**. The properties window for that attribute appears.

For example, to change the `ServiceMaxThreads` attribute, right-click **ServiceMaxThreads** and select **Properties**. The `ServiceMaxThreads` Properties window appears.



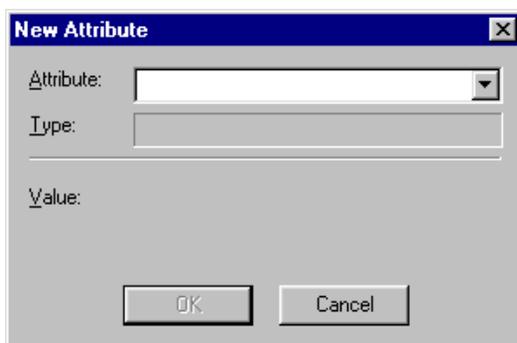
- 2 Type a new value for the attribute in the Value field, and click **OK**. The attribute is changed.
- 3 Save the configuration.

NOTE: When you add or change a static attribute, you must restart the SequeLink service before the change takes effect. Dynamic attributes become effective after the attribute is added or changed and the configuration is saved.

For a description of SequeLink service attributes and whether the attribute is static or dynamic, see [Appendix D "SequeLink Service Attributes" on page 361](#).

Adding a Service Attribute

- 1 Right-click any SequeLink service attribute category, and select **New / Attribute**. The New Attribute window appears.



NOTE: If you do not know the attribute category, you can right-click the Service Settings node, and select **New / Attribute**. In this case, the drop-down list displays all attributes.

- 2 From the Attribute drop-down list, select the attribute you want to add to the service. The Type field adjusts to show the type of value that is required.

NOTE: If an attribute is already defined and only one instance of the attribute is allowed, the attribute is not displayed in the drop-down list.

- 3 In the Value field, type a value for the attribute (or in some cases, select an option), and click **OK**. The attribute is added to the service.
- 4 Save the configuration.

NOTE: When you add or change a static attribute, you must restart the SequeLink service before the change takes effect. Dynamic attributes become effective after the attribute is added or changed and the configuration is saved.

For a description of SequeLink service attributes, see [Appendix D “SequeLink Service Attributes” on page 361](#).

Deleting a Service Attribute

- 1 Right-click the SequeLink service attribute you want to delete, and select **Delete**.
- 2 You are prompted to confirm the deletion. Click **OK** to confirm. The attribute is deleted from the service configuration.
- 3 Save the configuration.

NOTE: When you delete a static attribute, you must restart the SequeLink service before the change takes affect. Deletion of dynamic attributes becomes effective after the attribute is deleted and the configuration is saved.

For a description of SequeLink service attributes, see [Appendix D “SequeLink Service Attributes” on page 361](#).

Configuring Monitoring

SequeLink provides the following levels of monitoring for both SequeLink Agent and SequeLink data access services, listed here from highest-level to lowest-level:

- **Service monitoring** monitors these activities by service:
 - Statistics of received packets and sent packets
 - Sessions started and statements opened
 - Active statements and sessions
 - Fetched rows and affected rows
 - Transactions
- **Session monitoring** monitors these activities by session within a service:
 - Statistics of received packets and sent packets
 - Statements opened and active statements
 - Fetched rows and affected rows
 - Transactions
 - Information about each session, such as start time, client information (network address, data source used by the client, and type of client), native database session identification, and database user
- **Statement monitoring** monitors these activities by statement within a session:
 - Fetched rows and affected rows
 - SQL statements issued

To enable monitoring at one of the listed levels, higher-level monitoring must be enabled. For example, you cannot monitor Session information unless Service monitoring is enabled. Similarly, you cannot monitor Statement information unless both Service monitoring and Session monitoring are enabled.



On Windows NT and UNIX, both a monitoring and an event trace profile are enabled when you install SequeLink Server.

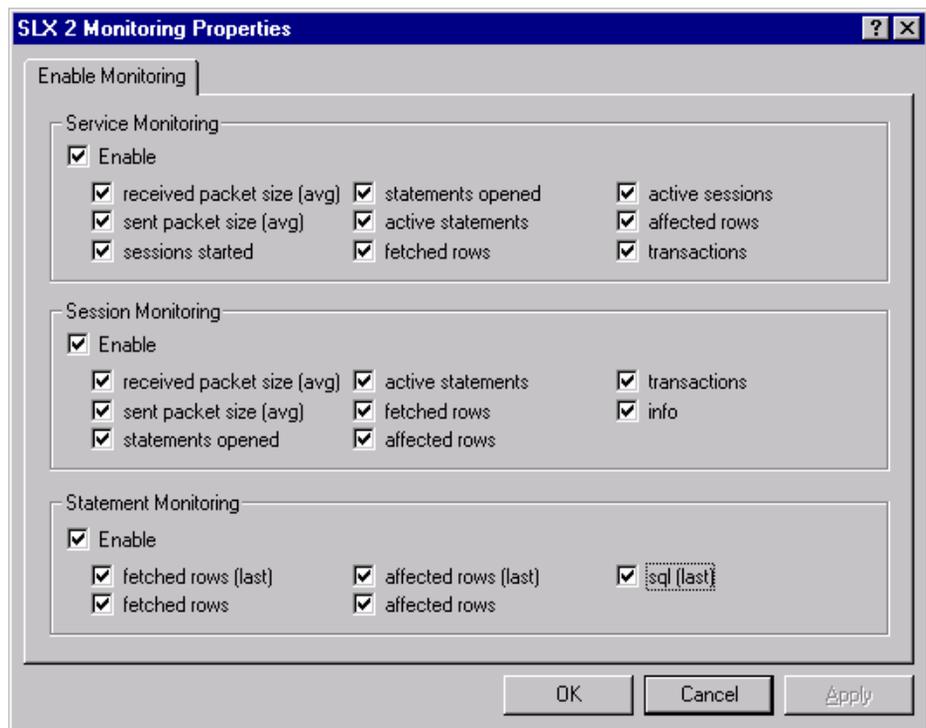
After installation, you can create a new monitoring profile or modify an existing profile.

NOTE: You can configure only one monitoring profile for each SequeLink service.

Also, you can integrate SequeLink monitoring with the Windows NT Performance Monitor tool, which allows you to access monitoring information from the Windows NT tool.

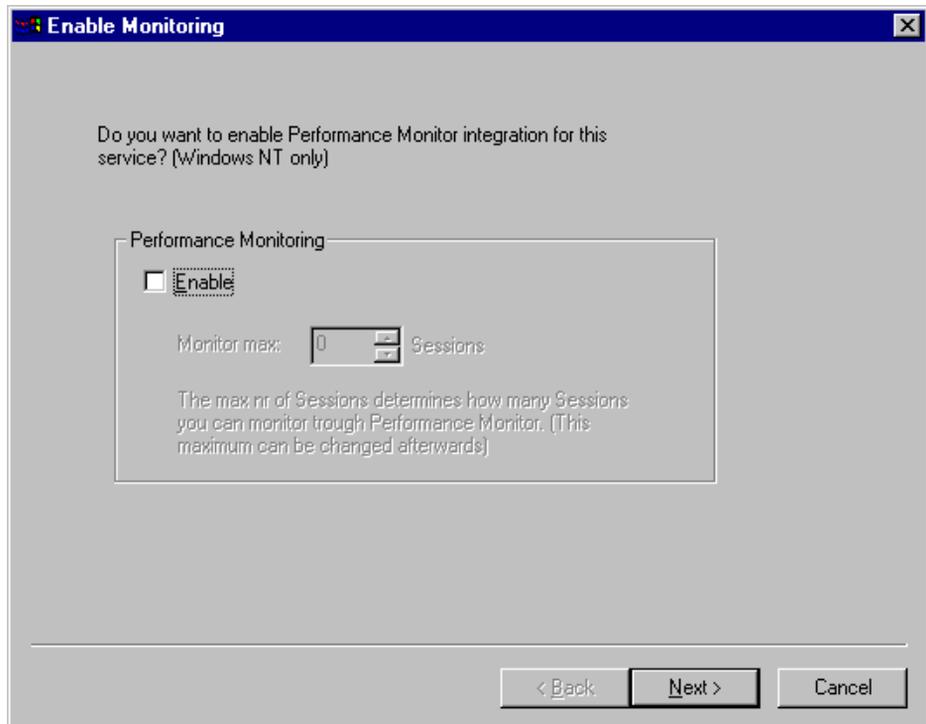
Creating a Monitoring Profile

- 1 Select the **Profiles** node for a SequeLink service (which is beneath the Configuration node). Select **Action / New / Monitoring Profile**. The Monitoring window appears.





For Windows NT users: When you create a profile, the Enable Monitoring window appears before the Monitoring window if you have the Windows NT Performance Monitor tool installed on the same Windows NT server on which the SequeLink Server and SequeLink Manager Snap-In are installed.



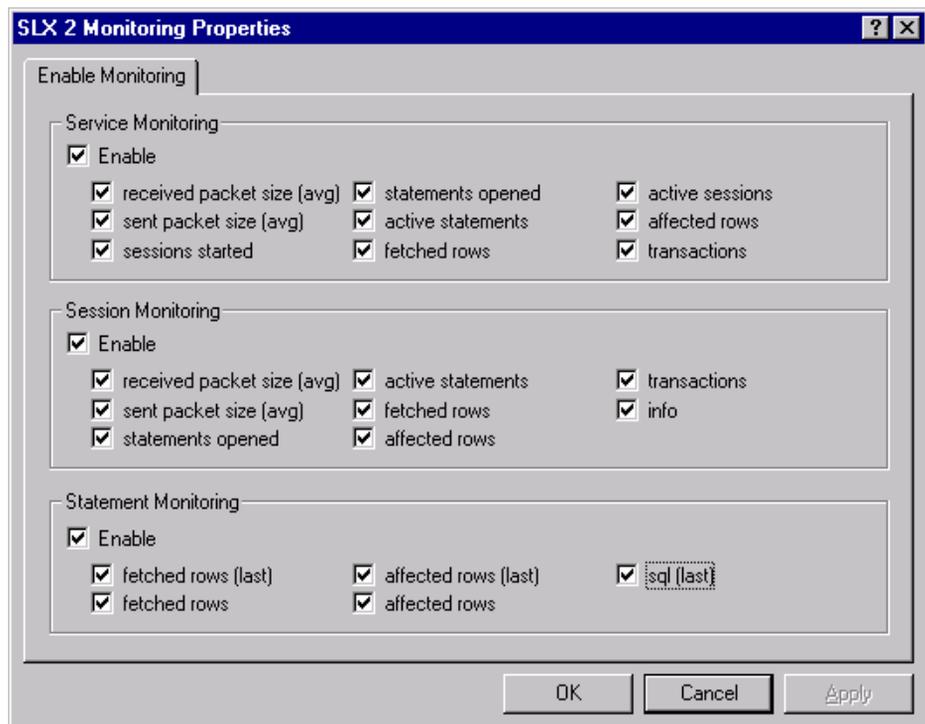
If you want to integrate SequeLink monitoring with the Windows NT Performance Monitor tool, select the **Enable** check box. Then, click **Next**. The Monitoring window appears.

For instructions on integrating SequeLink with the Windows NT Performance Tool, see [“Integrating SequeLink Monitoring with the Windows NT Performance Tool”](#) on page 81.

- 2 Perform any of the following actions in the Monitoring window:
 - To enable any type of monitoring (Service Monitoring, Session Monitoring, and Statement Monitoring), select the **Enable** check box within the appropriate Monitoring group. Remember that to enable monitoring information at a monitoring level, you must enable the higher-level monitoring. Therefore, if you disable Service Monitoring, all lower-level monitoring information is also disabled.
 - To enable any property, select the check box beside the property.
 - To disable any types of monitoring (Service Monitoring, Session Monitoring, and Statement Monitoring), clear the **Enable** check box within the appropriate Monitoring group.
 - To disable any property, clear the check box beside the property.
- 3 Click **Next**. The Enable Monitoring window appears. Click **Finish** in this window to add the profile.
- 4 Save the configuration.
- 5 Restart the SequeLink service to activate the new monitoring profile.

Changing an Existing Monitoring Profile

- 1 Select the **Profiles** node for a SequeLink service (beneath the Configuration node). The monitoring profile is displayed in the Details pane. Double-click the monitoring profile. The Monitoring window appears.



- 2 Perform any of the following actions in the Monitoring window:
 - To enable any type of monitoring (Service Monitoring, Session Monitoring, and Statement Monitoring), select the **Enable** check box within the appropriate Monitoring group. Remember that to enable monitoring information at a monitoring level, you must enable the higher-level

monitoring. Therefore, if you disable Service Monitoring, all lower-level monitoring information is also disabled.

- To enable any property, select the check box beside the property.
 - To disable any types of monitoring (Service Monitoring, Session Monitoring, and Statement Monitoring), clear the **Enable** check box within the appropriate Monitoring group.
 - To disable any property, clear the check box beside the property.
- 3 Click **Next**. The Enable Monitoring window appears. Click **Finish** in this window to add the profile.
 - 4 Save the configuration.
 - 5 Restart the SequeLink service to activate the changed monitoring profile.

Configuring Event Tracing

Events are generated when the client application accesses data and when specific server activities occur, such as when a service starts or an error occurs. Depending on which SequeLink profiles are active, the information generated with the event is displayed as it occurs in the runtime monitor and is stored persistent in the event trace file.

By default, the event trace file is located in the *installdir*\tracing directory where *installdir* is your SequeLink Server installation directory.



On Windows NT and UNIX, both a monitoring and an event trace profile are enabled when you install SequeLink Server.

NOTE: You can configure only one event trace profile for each SequeLink service.

Creating an Event Trace Profile

- 1 Select the **Profiles** node for a SequeLink service (which is beneath the Configuration node). Select **Action / New / Event Trace Profile**. The Events window appears.
- 2 Enable and disable events:
 - To enable a group of events, select the check box beside the appropriate group name (Service, Session, Network, Error, Statement, Transaction, or Others).

NOTE: Event names that do not start with Service, Session, Network, Error, Statement, or Transaction are Other events (for example, Cursor Closed).
 - To enable individual events, select the check box beside the event in the scroll box on the left. See [Appendix E “SequeLink Events” on page 415](#) for a list and a description of all events.
 - To disable a group of events, clear the check box beside the appropriate group name (Service, Session, Network, Error, Statement, Transaction, or Others).

NOTE: Event names that do not start with Service, Session, Network, Error, Statement, or Transaction are Other events (for example, Cursor Closed).
 - To disable individual events, clear the check box beside the event in the scroll box on the left.
- 3 Optionally, you can add a filter on any event or group of events. To add a filter, type the filter in the Filter text box. Some events have a set of attributes. You can place a filter on the attributes of an event. For example, if you want to monitor and trace only authentication events for sessions

that are started by administrators, you would write the following filter for the Session Authenticated event:

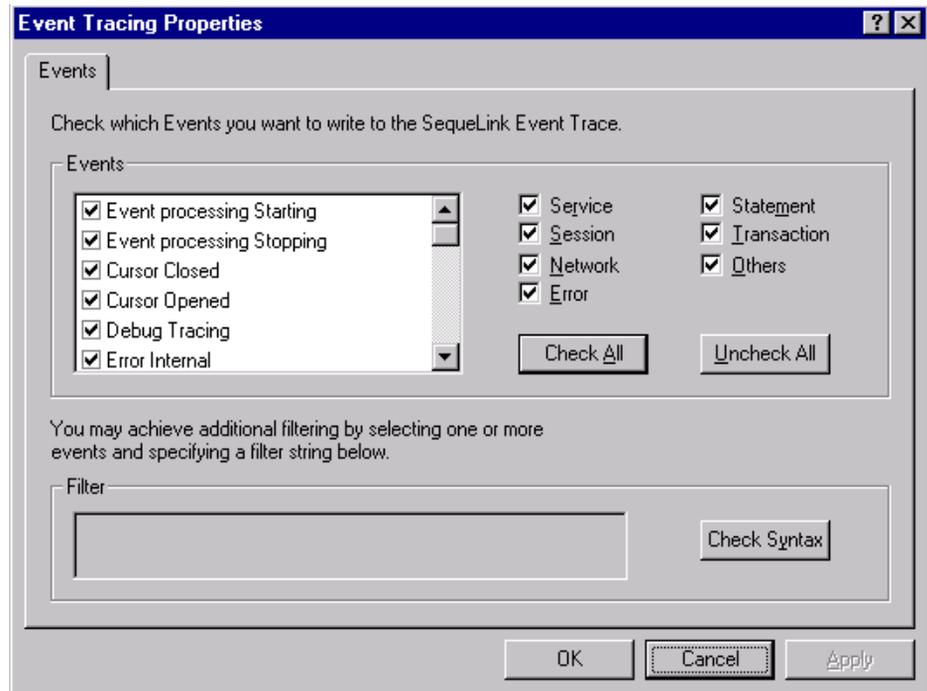
```
#{Authorization} = "administrator"
```

See [Appendix E “SequeLink Events” on page 415](#) for an explanation of the filter syntax, and a list and description of the attributes for each event.

- 4 Click **Next**. The Add Event Trace Profile window appears. Click **Finish** in this window to add the profile.
- 5 Save the configuration.
- 6 Restart the SequeLink service to activate the new event trace profile.

Change an Existing Event Trace Profile

- 1 Select the Profiles node for a SequeLink service (which is beneath the Configuration node). The existing event trace profile is displayed in the Details pane. Double-click the event trace profile. The Events window appears.



2 Disable and enable events:

- To enable a group of events, select the check box beside the appropriate group name (Service, Session, Network, Error, Statement, Transaction, or Others).

NOTE: Event names that do not start with Service, Session, Network, Error, Statement, or Transaction are Other events (for example, Cursor Closed).

- To enable individual events, select the check box beside the event in the scroll box on the left. See [Appendix E](#)

[“SequeLink Events” on page 415](#) for a list of all events and their definition.

- To disable a group of events, clear the check box beside the appropriate group name (Service, Session, Network, Error, Statement, Transaction, or Others).

NOTE: Event names that do not start with Service, Session, Network, Error, Statement, or Transaction are Other events (for example, Cursor Closed).

- To disable individual events, clear the check box beside the event in the scroll box on the left.
- 3 Optionally, you can add a filter on the event or group of events. Type a filter in the Filter text box. Some events have a set of attributes. You can place a filter on the attributes of an event. For example, if you want to monitor and trace only authentication events for sessions that are started by administrators, you would write the following filter for the Session Authenticated event:

```
${Authorization} = "administrator"
```

See [Appendix E “SequeLink Events” on page 415](#) for an explanation of the filter syntax, and a list and description of the attributes for each event.

- 4 Click **Next**. The Add Event Trace Profile window appears. Click **Finish** in this window to add the profile.
- 5 Save the configuration.
- 6 Restart the SequeLink service to activate the new event trace profile.

Integrating SequeLink Monitoring with the Windows NT Performance Tool

If you will be integrating SequeLink monitoring with the Windows NT Performance Monitoring tool, you must explicitly set the required counters in the Windows NT/Windows 2000 registry. When the SequeLink Server installation finishes, the files SWEVPERF.INI and SWEVPERF.H appear in your temporary directory (for example, C:\temp).

To integrate SequeLink monitoring with Windows NT performance monitoring:

- 1 Using an MS-DOS prompt, change the directory to the directory containing the SWEVPERF.INI file (for example, C:\temp).
- 2 Type the following command; then, press ENTER:

```
lodctr swevperf.ini
```
- 3 If you do not have an active (enabled) monitoring profile that is configured for integration with the Windows NT Performance Monitor tool, configure one. For instructions on configuring monitoring, see ["Configuring Monitoring" on page 71](#). To activate a new monitoring profile, restart the SequeLink service for which you defined the profile.

NOTE: If you have a monitoring profile that is not configured for integration with the Windows NT Performance Monitor Tool, delete that monitoring profile and create one that is configured for integration. Integration must be configured when you create the profile.

- 4 Start the Windows NT Performance tool and select the **Add to Chart** menu item. In the window that appears, select the **SequeLink 5.1 Services** object and select the counters that you want to monitor from the Instance list box.

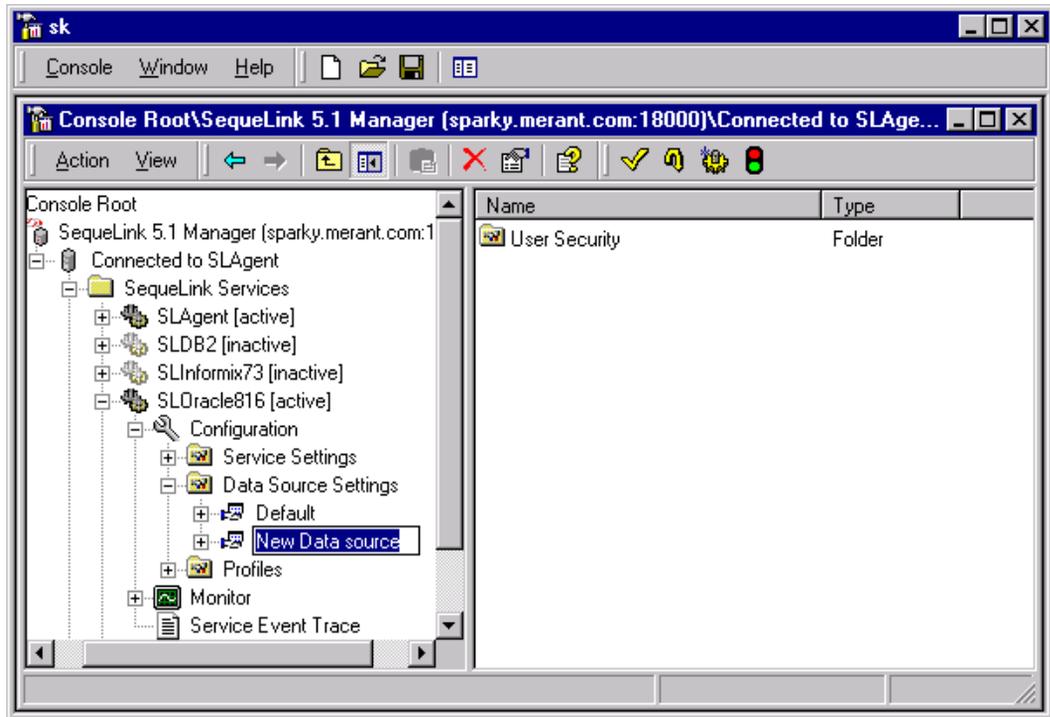
4 Configuring Server Data Sources Using the SequeLink Manager Snap-in

This chapter describes how to create and manage server data sources with the SequeLink Manager Snap-in. See [“About Data Sources” on page 37](#) for more information about data sources.

To do this...	See...
Create a server data source	“Creating a Server Data Source” on page 84
Delete a server data source	“Deleting a Server Data Source” on page 85
Rename a server data source	“Renaming a Server Data Source” on page 85
View server data source attributes	“Viewing Server Data Source Attributes” on page 85
Add a server data source attribute	“Adding a Server Data Source Attribute” on page 86
Change the default value of a server data source attribute	“Changing the Value of a Server Data Source Attribute” on page 87

Creating a Server Data Source

- 1 Right-click the Datasource Settings node and select **New / Datasource**. A new server data source appears in the Details pane.



- 2 When created, the new data source is an editable field. Type the name of the data source and press ENTER.
- 3 Save the configuration.

When you create a server data source, the attributes for the new server data source are copied from the default data source. This default data source is created when the data access service is created. For instructions on viewing server data source attributes, see [“Viewing Server Data Source Attributes” on page 85](#). For instructions on changing server data source attributes, see

[“Changing the Value of a Server Data Source Attribute” on page 87.](#)

Deleting a Server Data Source

- 1 Right-click the server data source you want to delete, and select **Delete**.
- 2 You are asked to confirm the deletion. To confirm, click **OK**. The server data source is deleted.

NOTE: You cannot delete the default data source.

- 3 Save the configuration.

Renaming a Server Data Source

- 1 Right-click the server data source you want to rename, and select **Rename**. The data source becomes an editable field. Type the name of the data source and press ENTER.
- 2 Save the configuration.

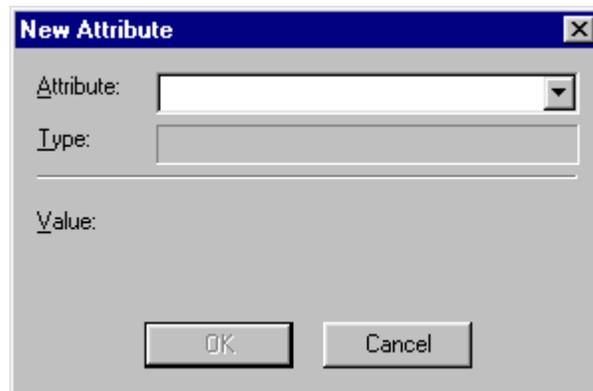
Viewing Server Data Source Attributes

To view attributes for a data source, select the server data source. The available attribute categories appear in the Details pane. To view the attributes, select any attribute category. The attributes and their values appear in the Details pane.

For a description of SequeLink service attributes, see [Appendix D “SequeLink Service Attributes”](#) on page 361.

Adding a Server Data Source Attribute

- 1 Right-click the data source to which you want to add an attribute, and select **New / Attribute**. The New Attribute window appears.



- 2 In the Attribute drop-down list, select the attribute you want to add to the server data source.
- 3 In the Value field, change the default value of the attribute if necessary; then, click **OK**. The attribute is added to the server data source.
- 4 Save the configuration.

For a description of SequeLink data source attributes, see [Appendix D “SequeLink Service Attributes”](#) on page 361.

Changing the Value of a Server Data Source Attribute

When you create a server data source, the attributes of the new data source are copied from the default data source.

To change the value of a server data source attribute:

- 1 Right-click the data source attribute, and select **Properties**. The Properties window for that attribute appears.
- 2 Type a new value for the attribute in the Value field, and click **OK**. The attribute is changed.
- 3 Save the configuration.

For a description of SequeLink data source attributes, see [Appendix D “SequeLink Service Attributes” on page 361](#).

5 Managing Data Access Activity Using the SequeLink Manager Snap-in

This chapter describes the tasks that you perform to manage and monitor data access activity using the SequeLink Manager Snap-in.

To do this...	See...
Kill a session	“Killing a Session” on page 89
View event tracing information	“Viewing Event Tracing Information” on page 90
View details about an active service	“Viewing Details About an Active Service” on page 94
View active sessions and details about an active session	“Viewing Active Sessions and Details About an Active Session” on page 95

Killing a Session

NOTE: To view sessions for a SequeLink service, monitoring must be enabled for the service. For information about enabling monitoring for a SequeLink service, see [“Configuring Monitoring” on page 71](#).

To kill a session:

- 1 Click the **Monitor / Active sessions** node of the SequeLink service. The Details pane shows a list of active sessions.
- 2 Right-click the session you want to kill, and select **Kill**.

Viewing Event Tracing Information

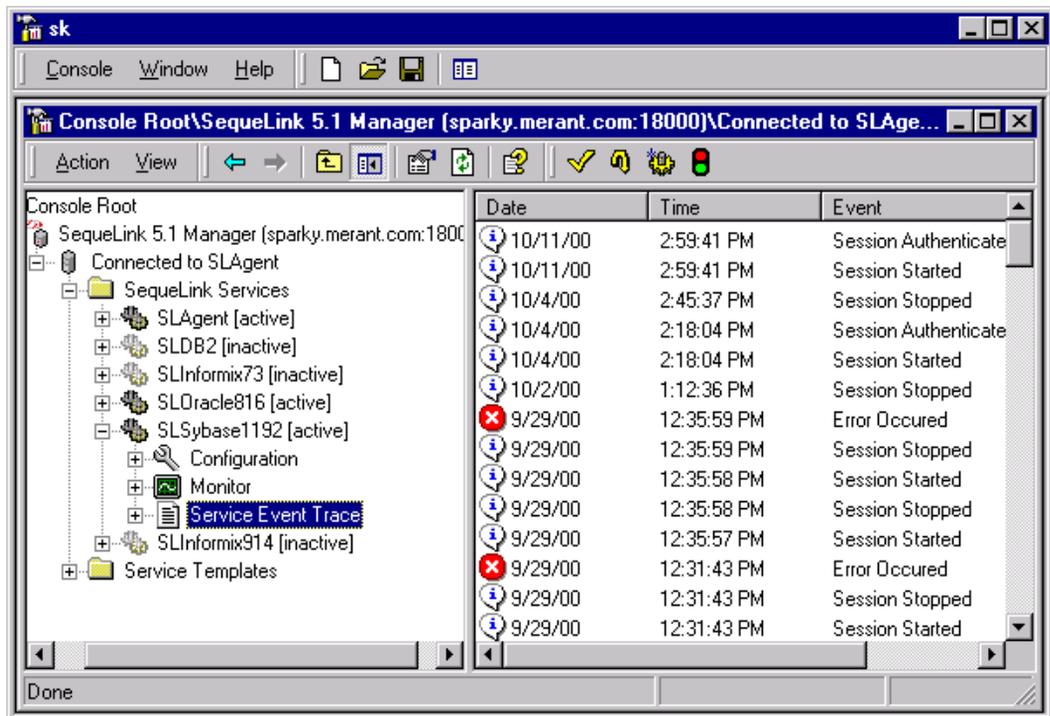
You can view all events of a service or filter the events to view. You can also use the Find function to search for a specific event in the events that are displayed in the Details pane.

NOTE: When the service event trace is refreshed, it is possible that the displayed information may no longer be available in the event trace file because the event trace file is circular, meaning that the oldest events are overwritten with the newest events. If this happens, the SequeLink Manager will display "Information not available."

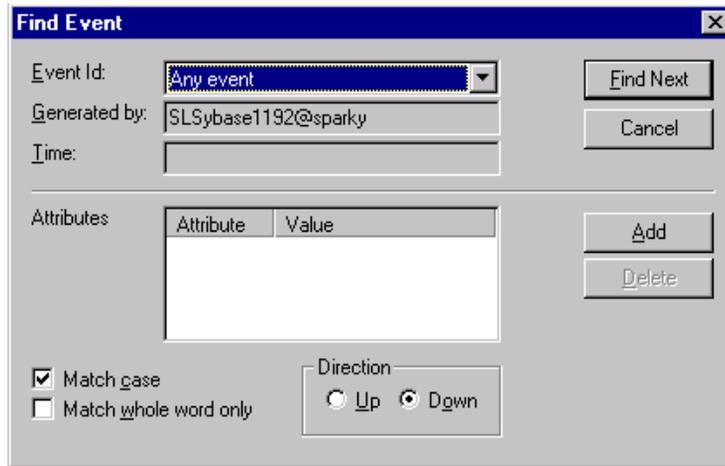
See ["Event Handling" on page 35](#) for general information about event handling.

To view event trace information:

- 1 Click the **Service Event Trace** node of a service. The Details pane displays a list of all events. The events that are listed depends on how event tracing is configured. See [“Configuring Event Tracing” on page 76](#).



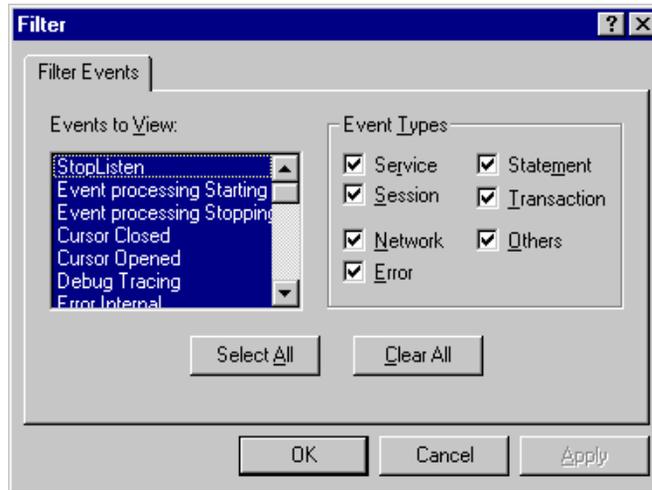
- 2 Optionally, you can search for a specific event in the Details pane. To do this, right-click the **Service Event Trace** node of a service; then, select **Find Event**. The Find Event window appears.



In this window, perform the following actions:

- a Select the type of event you want to view from the Event ID drop-down list.
- b To search down in the event list, select **Down** in the Direction group. To search up, select **Up**.
- c Optionally, you can define search criteria for the event. Click **Add**. The New Attribute window appears. In this window, select the attribute by which you want to search from the Attribute drop-down list. In the Value field, type the search criteria for the attribute. For example, if you want to search for Session Started events from a certain client host (such as 'sales1.company.com'), you would select **Session Started** in the Find Event window, click **Add**, select **ClientInfo** from the Attribute drop-down list, and type 'sales1.company.com' in the Value field.
- d Click **Find Next** to find the next event.

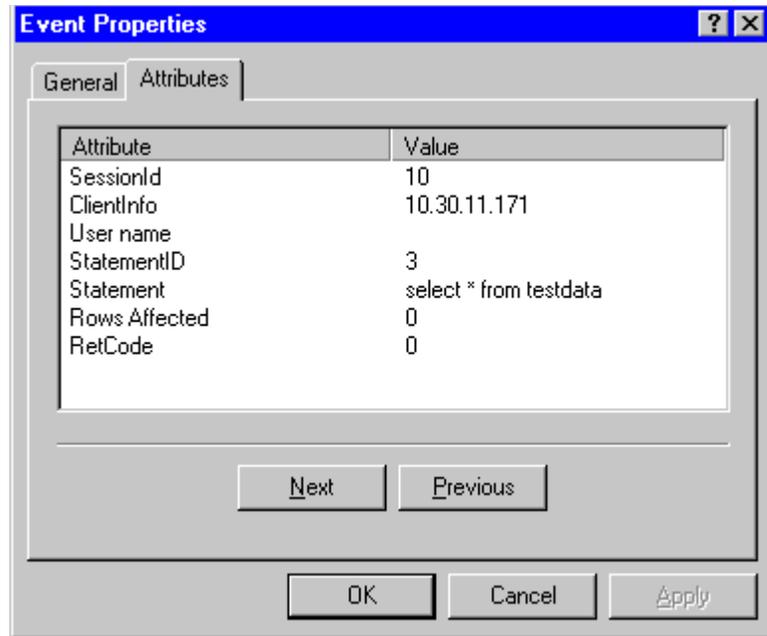
- 3 Optionally, you can place a filter on the search to display only specific events in the Details pane. To do this, click the **Service Event Trace** node of a service; then, select **View / Filter**. The Filter window appears.



In this window, perform one of the following actions:

- Select the events you want to view from the Events to View list. To select non-adjacent events from the list, hold down the CTRL key while selecting the events. To select adjacent events from the list, hold down the SHIFT key while selecting the events.
 - Select the types of events you want to view by selecting the appropriate Event Types check boxes. When you select an event type, the corresponding events are highlighted in the Events to View list.
- 4 To view information about a specific event, right-click an event in the Details pane, and select **Properties**. The Event Properties window appears.

- 5 Click the **Attributes** tab to view the attributes for that event.



Viewing Details About an Active Service

Select the **Monitor** node of the service for which you want details. The Details pane shows details about the active service. The level of detail that is displayed depends on the how monitoring is configured. See ["Configuring Monitoring" on page 71](#).

For information about refreshing information about active services, see ["Refreshing Active Information" on page 57](#).

Viewing Active Sessions and Details About an Active Session

- 1 Select the **Monitor** node of the SequeLink service for which you want to view active sessions.
- 2 Select the **Active sessions** node. The Details pane shows all active sessions for that SequeLink service.

NOTE: Optionally, you can sort active sessions that appear in the Details pane based on session name, session type, IP address, or DBMS user. To do this, click the appropriate header category at the top of the Details pane. The active session list is sorted based on the criteria you selected.

- 3 To view details about an active session, expand the **Active sessions** node. In the console tree in the left pane, select the session for which you want details. The Details pane displays details about that session.

For information about refreshing information about active sessions, see [“Refreshing Active Information” on page 57](#).

6 Using SequeLink Manager Commands

This chapter describes how to use the SequeLink Manager Command-Line Tool, issue SequeLink Manager commands, and lists some commonly used SequeLink Manager commands. See [“SequeLink Server System Administration” on page 27](#) for general information about the SequeLink Manager.

Using the SequeLink Manager Command-Line Tool



The SequeLink Manager Command-Line Tool runs on Windows and UNIX only. It allows you to configure and manage your SequeLink environment remotely from a networked client or locally from a SequeLink Server by issuing commands through the command-line interface.

OS/390

NOTE: To configure and manage SequeLink services on OS/390 or to create OS/390-specific core entities such as DB2 interfaces, use the SequeLink Manager for OS/390. See [Chapter 8 “Configuring SequeLink Services Using the SequeLink Manager for OS/390” on page 125](#). Monitoring can be performed using any SequeLink Manager.

The methods available for issuing SequeLink Manager commands are:

- Direct
- Batch
- Interactive

Direct Command Execution

Using direct command execution, you can invoke one command at a time on the command line. The command syntax for direct execution is:

```
executable command_name [parameters]
```

where:

executable is *installdir*\admin\swcla.exe on Windows and *installdir*/admin/swcla on UNIX. See [“Invoking the SequeLink Manager Command-Line Tool” on page 100](#) for the parameters you can specify when invoking the tool.

command_name is any SequeLink Manager command (short or long name). See [Appendix B “SequeLink Manager Commands” on page 309](#) for a list and description of each command.

parameters are valid options for the specified command. When using direct command execution to issue a command, you must provide all of a command’s required and optional parameters in the correct position (specify the parameters in the order they are documented).

Batch Command Execution

The batch method of executing commands allows you to execute a script file that contains SequeLink Manager commands. The command syntax for batch execution is:

```
executable -i script_file
```

where:

executable is *installdir*\admin\swcla.exe on Windows and *installdir*/admin/swcla on UNIX. See [“Invoking the SequeLink Manager Command-Line Tool” on page 100](#) for the parameters you can specify when invoking the tool.

script_file is the name of the file to execute. This file can contain SequeLink Manager commands only. When using a script file to execute commands, you must provide all of a command's required and optional parameters in the script file (specify the parameters in the order they are documented).

Interactive Command Execution

Using interactive command execution, you do not have to specify all the command parameters on the command line. The command-line tool will prompt you for the required parameters. To start interactive mode, type:

```
executable
```

where:

executable is *installdir\admin\swcla.exe* on Windows and *installdir/admin/swcla* on UNIX. See [“Invoking the SequeLink Manager Command-Line Tool” on page 100](#) for the parameters you can specify when invoking the tool.

The tool is invoked and a command prompt is displayed, along with copyright text (unless you invoked the tool with the `-nologo` flag):

```
swcla>
```

At the `swcla` command prompt, type either a command with all of its parameters or a command name, and the tool will prompt you for the required parameters.

To exit interactive mode, type:

```
exit
```

General Rules

- SequeLink Manager command names are not case-sensitive; however, the command parameter *service_name* is case-sensitive.
- If the value of a command parameter contains spaces, the value must be enclosed within single quotes (') or double quotes (").
- If the value of a command parameter contains single or double quotes, use single quotes to quote double quotes and double quotes to quote single quotes.
- The pound sign (#) is a comment character. All text that follows the pound sign on the same line is ignored.
- When issuing commands using the direct or batch method, you must specify all of a command's required and optional parameters in the correct position (specify the parameters in the order they are documented).

Invoking the SequeLink Manager Command-Line Tool

You invoke the SequeLink Manager Command-Line Tool using the following syntax:

```
executable [-nologo] [-i script_file] [-o output_file] [-e error_file]
[-l | -r host:port] [-uid user_id [-pwd password]] [command]
```

where:

executable is *installdir*\admin\swcla.exe on Windows and *installdir*/admin/swcla on UNIX.

-nologo disables the display of the copyright banner.

-i *script_file* specifies a script file to execute.

`-o output_file` specifies the name of a file in which the command-line tool will write all of its output (except errors).

`-e error_file` specifies the name of a file in which the command-line tool will write all its errors (not normal output). All error and normal output can be written to the same file if the file specified for the `-o` and `-e` flags is the same.

`-l` specifies to use the local host configuration.

`-r host:port` specifies to use the remote host configuration. In this case, you must specify the host name and port of the remote server.

`-uid user_id` specifies a user ID that has been configured before a user can use a local or remote host configuration. This parameter is valid only in combination with the `-l` or `-r` parameters.

`-pwd password` specifies a password that has been configured before a user can use a local or remote host configuration. This parameter is valid only in combination with the `-l` or `-r` parameters.

`command` is the name of any SequeLink Manager command and its parameters. See [Appendix B “SequeLink Manager Commands” on page 309](#) for a list and description of each command.

When invoking the SequeLink Manager Command-Line Tool, you must choose whether you want the tool to connect to a local SequeLink Agent (a SequeLink Agent service running on the same machine as the tool) or a remote SequeLink Agent (a SequeLink Agent service running on another machine). If you have not connected to a SequeLink Agent, the SequeLink Manager Command-Line Tool will return the following message when you issue a command:

```
[SequeLink error 5509] Command not available for current configuration.
```

You can invoke the SequeLink Manager Command-Line Tool and connect to a local or remote SequeLink Agent after you invoke the tool or when you invoke the tool as shown in the following examples:

Example A: Connecting to a Local or Remote SequeLink Agent After Invoking the Tool

```
SLServer51\admin\swcla.exe
```

This example invokes the tool without specifying whether it will connect to a local or remote SequeLink Agent. You must now explicitly connect to a local or remote SequeLink Agent using the `ActivateLocalConfig` or `ActivateRemoteConfig` commands described in [Appendix B “SequeLink Manager Commands” on page 309](#) before you can enter any other commands.

Example B: Connecting to a Local SequeLink Agent When Invoking the Tool

```
SLServer51\admin\swcla.exe -l
```

This example connects the tool to a local SequeLink Agent. The administrator will be prompted for the user ID and password for the SequeLink administrator. The administrator can now enter any SequeLink Manager command described in [Appendix B “SequeLink Manager Commands” on page 309](#).

Example C: Connecting to a Remote SequeLink Agent When Invoking the Tool

```
SLServer51\admin\swcla.exe -r
```

This example connects the tool to a remote SequeLink Agent. The administrator will be prompted for the host name and port of the remote server. Then, the administrator will be prompted for the user ID and password for the SequeLink administrator. The administrator can now enter any SequeLink Manager command described in [Appendix B “SequeLink Manager Commands” on page 309](#).

Displaying Help for a Command

To display help for a command, type the following at a command-line tool prompt:

```
help [long_command_name | short_command_name]
```

For example:

```
help DataSourceCreate
```

You can also display help about the different options you have when invoking the command-line tool. To do this, type the following at a command-line tool prompt:

```
help
```

Commonly Used SequeLink Manager Commands

This section lists some commonly used SequeLink Manager commands. Both long and short command names are listed. For a complete list of SequeLink Manager commands, see [Appendix B “SequeLink Manager Commands” on page 309](#).

Starting a SequeLink Service

Command:	ServiceStart ss
Syntax:	{ServiceStart ss} <i>service_name</i>
Example:	ss SLOracle8

Stopping a SequeLink Service

Command: ServiceStop | sst

Syntax: {ServiceStop | sst} *service_name*

Example: sst SLOracle8

Creating a SequeLink Service

Command: ServiceCreate | sc

Syntax: {ServiceCreate | sc} *service_name service_ID tcp_port*

Service template IDs can be obtained using the ServiceTemplateList|stl command.

Example: sc SLOracle81 SL5_Oracle8 19996

Deleting a SequeLink Service

NOTE: Before deleting a SequeLink service, you must stop the service that you want to delete.

Command: ServiceDelete | sd

Syntax: {ServiceDelete | sd} *service_name*

Example: sd SLOracle8

Viewing Service Attributes

Command: ServiceInfo | si

Syntax: {ServiceInfo | si} *service_name*

Example: si SLOracle8

Changing a Service Attribute

Command: ServiceAttributeReplace | sar

Syntax: {ServiceAttributeReplace | sar} *service_name attribute_name value*

Example: sar SLOracle8 ServiceUser[2] devuser

Adding a Service Attribute

Command: ServiceAttributeAdd | saa

Syntax: {ServiceAttributeAdd | saa} *service_name attribute_name value*

Example: saa SLOracle8 ServiceUser sqlnk

Deleting a Service Attribute

Command: ServiceAttributeDelete | sad

Syntax: {ServiceAttributeDelete | sad} *service_name attribute_name*

Example: sad SLOracle8 ServiceCodePage
sad SLOracle8 ServiceUser[2]

Creating a Server Data Source

Command: DataSourceCreate | dsc

Syntax: {DataSourceCreate | dsc} *service_name data_source_name*

Example: dsc SLOracle8 DS_Employees

Deleting a Server Data Source

Command: DataSourceDelete | dsd

Syntax: {DataSourceDelete | dsd} *service_name data_source_name*

Example: dsd SLOracle8 DS_Employees

Changing a Server Data Source Attribute

Command: DataSourceAttributeReplace | dsar

Syntax: {DataSourceAttributeReplace | dsar} *service_name data_source_name attribute_name value*

Example: dsar SLOracle8 DS_Employees DataSourceCurrentCatalog partners

Adding a Server Data Source Attribute

- Command:** DataSourceAttributeAdd | dsaa
- Syntax:** {DataSourceAttributeAdd | dsaa} *service_name*
data_source_name attribute_name value
- Example:** dsaa SLOracle8 DS_Employees DataSourceCurrentCatalog
employees

Deleting a Server Data Source Attribute

- Command:** DataSourceAttributeDelete | dsad
- Syntax:** {DataSourceAttributeDelete | dsad} *service_name*
data_source_name attribute_name
- Example:** dsad SLOracle8 DS_Employees DataSourceCurrentCatalog

Killing a Session

- Command:** SessionStop | sess
- Syntax:** {SessionStop | sess} *service_name session_ID*
- Session IDs can be obtained with the ServiceActiveInfo | sai command.
- Example:** sess SLOracle8 5

Viewing Event Tracing Information

Command: EventList | el

Syntax: {eventlist | el} *service_name* | [remote]file=
event_trace_file_name
 [details]
 [[{service | srvc}] |
 [{session | sess}] |
 [{statement | stmt}] |
 [{transaction | trans}] |
 [{network | net}] |
 [{error | err}] |
 [{other | oth}]]]
 [count=[{ + | - }] {all | *number*}]
 [offset={begin | end} [{ + | - }] *number*]
 [query='*custom_event_filter_string*']

Example: **Local host or remote configuration examples:**

```
el SLAgent details

el SLOracle details service count=all offset=10

el SLOracle80 stmt query='${ReturnCode} != 0'

el "file=C:\ProgramFiles\Merant\SLSERVER51\tracing\
SLOracle81.trc" count=10

el "remotefile=C:\ProgramFiles\Merant\SLSERVER51\tracing\
SLOracle81.trc" service details
```

Offline configuration examples:

```
el "file=C:\ProgramFiles\Merant\SLSERVER51\tracing\
SLOracle81.trc"

el "file=C:\ProgramFiles\Merant\SLSERVER51\tracing\
SLOracle81.trc" count=10

el "file=C:\ProgramFiles\Merant\SLSERVER51\tracing\
SLOracle81.trc" count=-all offset=end
```

```
el "file=C:\ProgramFiles\Merant\SLSERVER51\tracing\
SLoracle81.trc" offset=5 service session

el "file=C:\ProgramFiles\Merant\SLSERVER51\tracing\
SLoracle81.trc" service details
```

Viewing Active Services

Command: ServiceList | sl

Syntax: {ServiceList | sl}

Example: sl

Viewing Details About an Active Service (Including Active Sessions)

Command: ServiceActiveInfo | sai

Syntax: {ServiceActiveInfo | sai} *service_name*

Example: sai SLOracle8

Viewing Details About an Active Session

Command: SessionInfo | sesi

Syntax: {SessionInfo | sesi} *service_name session_ID*

Session IDs can be obtained using the ServiceActiveInfo | sai command.

Example: sesi SLOracle8 5

7 Using the SequeLink Manager for OS/390

OS/390 You can use the SequeLink Manager for OS/390 to configure and manage SequeLink Server for OS/390 locally using an ISPF dialog. This chapter describes how to use the SequeLink Manager for OS/390 and the SequeLink Manager for OS/390 Operator Interface.

Starting the SequeLink Manager for OS/390

How you start the SequeLink Manager for OS/390 depends on whether you have allocated the SequeLink ISPF libraries to the TSO session, which allows you to use a simpler command syntax to start the SequeLink Manager for OS/390.

If you are planning to use the SequeLink Manager for OS/390 regularly, we recommend that you allocate the SequeLink ISPF libraries to the TSO session as shown in [Table 7-1](#).

Table 7-1. SequeLink ISPF Library Allocation (OS/390)

SequeLink ISPF Libraries	Allocate to...
<i>SequeLink_HLQ</i> .CLIST	SYSPROC or SYSEXEC
<i>SequeLink_HLQ</i> .LOADLIB	ISPLLIB
<i>SequeLink_HLQ</i> .MSGS	ISPMLIB
<i>SequeLink_HLQ</i> .PANELS	ISPLLIB

NOTE: *SequeLink_HLQ* is the SequeLink high-level qualifier identifying the libraries.

Table 7-1. SequeLink ISPF Library Allocation (OS/390) (cont.)

SequeLink ISPF Libraries	Allocate to...
<i>SequeLink_HLQ</i> .SKELS	ISPSLIB
<i>SequeLink_HLQ</i> .TABLES	ISPTLIB

NOTE: *SequeLink_HLQ* is the SequeLink high-level qualifier identifying the libraries.

Starting the SequeLink Manager When ISPF Libraries Are Allocated

Type the following command:

```
TSO %SSMC [HLQ(SequeLink_HLQ)]
```

where *SequeLink_HLQ* is the SequeLink high-level qualifier that identifies the libraries. You are only required to type the SequeLink high-level qualifier the first time you start the SequeLink Manager for OS/390 because this qualifier is saved in the user's ISPF profile.

For example:

```
TSO %SSMC HLQ(MERANT.SL510)
```

or

```
TSO %SSMC
```

Starting the SequeLink Manager When ISPF Libraries Are Not Allocated

Type the following command:

```
TSO EX 'SequeLink_HLQ.CLIST(SSMC)' ['HLQ(SequeLink_HLQ)']
```

where *SequeLink_HLQ* is the SequeLink high-level qualifier that identifies the libraries. You are only required to type the

SequeLink high-level qualifier the first time you start the SequeLink Manager for OS/390.

For example:

```
TSO EX 'MERANT.SL510.CLIST(SSMC)' 'HLQ(MERANT.SL510)'
```

or

```
TSO EX 'MERANT.SL510.CLIST(SSMC)'
```

Working with the SequeLink Manager for OS/390

When you start the SequeLink Manager for OS/390, a copyright appears. Press ENTER to continue. The SequeLink Manager for OS/390 main menu appears.

```
DataDirect SequeLink Manager for OS/390 - Main menu

Command ===>

Choose a dialog to start and press Enter:

    0. Settings
    1. SequeLink Server management dialog

F1=Help      F3=End      F5=View Err F12=Cancel
```

Generally, the SequeLink Manager for OS/390 ISPF panels list items in your SequeLink configuration, allow you to select actions that affect these items, or allow you to view or change attributes.

For example, from the SequeLink Manager for OS/390 main menu, you can perform the following tasks:

- Type 0 to change the default dialog settings, such as changing the high-level qualifier for the SequeLink ISPF data sets. For instructions on changing the default dialog settings, see [“Changing the Default Dialog Settings” on page 115](#).
- Type 1 to configure and manage SequeLink services locally on the OS/390 machine. The ServerList panel appears listing all SequeLink Servers defined on the OS/390 machine. For instructions on configuring SequeLink services on OS/390, see [Chapter 8 “Configuring SequeLink Services Using the SequeLink Manager for OS/390” on page 125](#).

Using the Function Keys

When working with the SequeLink Manager for OS/390, you can use the function keys listed in [Table 7-2](#).

Table 7-2. SequeLink Manager for OS/390 Function Keys

Key	Description
F1	Panel/field help
F2	Split
F3	End with save of changes
F5	Display errors
F7	Scroll up
F8	Scroll down
F9	Swap
F10	Scroll left

NOTE: You can use the standard ISPF command `FKA ON` to switch on the display of the function key labels at the bottom of each panel.

Table 7-2. SequeLink Manager for OS/390 Function Keys (cont.)

Key	Description
F11	Scroll right
F12	Cancel without save of changes or clear validation messages

NOTE: You can use the standard ISPF command `FKA ON` to switch on the display of the function key labels at the bottom of each panel.

Changing the Default Dialog Settings

- From the SequeLink Manager for OS/390 main menu, type `0`; then, press `ENTER`. The Settings panel allows you to change the high-level qualifier used by the dialog to locate the SequeLink ISPF data sets. On this panel, you can also change the TCP/IP stack used by this dialog when connecting to an active SequeLink Server.

```

Menu List Mode Functions Utilities Help
-----
      DataDirect SequeLink Manager for OS/390 - Settings
Change the default dialog settings:

Sequelink High-Level Qualifier   SQLNK.SLX2
TCP/IP stack to use:
1  1.  IBM CS
   2.  Interlink TCP Access 5.2
Interlink TCP Access 5.2 SASLINK library

If the settings are changed, you need to restart this application to
activate them.

Command ==>
F1=Help      F3=End      F5=View Err  F12=Cancel
-----

```

- 2 To change the high-level qualifier for the SequeLink ISPF data sets, press the TAB key to navigate to the SequeLink High Level Qualifier field and type the new high-level qualifier.
- 3 To change the TCP/IP stack used by the SequeLink Manager to establish a connection to an active server, press the TAB key to navigate to the TCP/IP stack to use field, and type:
 - 1 to choose IBM CS (Communication Server)
 - 2 to choose Interlink TCP/IP

NOTE: If you choose Interlink TCP/IP, you must also provide the name of the Interlink library that contains the SAS/C runtime routines for Interlink. Usually, this data set is referred to as the SASLINK library.

- 4 Press ENTER to validate the changes that were made.

NOTE: You must restart the SequeLink Server before this change will take effect.

Using the Server Management Tree

When you select a SequeLink Server, the server management tree appears.

```

DataDirect SequeLink Manager for OS/390

Command ==>>>                               Scroll > CSR

Management Tree for server ACCT1
To see a list of valid actions on a node, type '?' beside it.
Use '/' to expand or collapse tree branches.
Valid commands are: EXP SAVE REFRESH ERRSTK
-----
- ACCT1 (offline)
  - Global Settings
  - DB2 Interfaces
    - DSN6
  - UID Maps
  - Sequelink Services
    + ACCT1
    + MVSDDB26
  + Service Templates

F1=Help      F3=End      F5=View Err  F7=Up      F8=Down     F10=Left
F11=Right    F12=Cancel

```

You can use the server management tree to view or change entities defined within the SequeLink Server, such as:

- Global settings
- DB2 interfaces
- User ID (UID) maps
- SequeLink services and their configuration settings

Press the TAB key to navigate to the tree nodes on the server management tree.

To perform an action on a tree node, type the action code at the tree node. To find which actions each node accepts, type ? beside the node you want information about and press ENTER. For example, when you type ? beside a SequeLink service, a

message appears telling you that the node will accept **D** (Delete), **S** (Select), **/** (Expand or Contract), **+** (Expand), and **-** (Contract).

Using the Command prompt, you can also type the following commands that affect the server management tree:

- **EXP** or **EXPAND** expands the tree so that all nodes become visible.
- **SAVE** saves the current configuration to disk.
- **REFRESH** rebuilds the tree (if the server is online, the monitor data is refreshed also).
- **ERRSTK** displays the error stack.

Using the SequeLink Manager for OS/390 Operator Interface

Some Operator Interface commands can be useful in performing administration tasks. These commands can be issued using the Operator Interface of the SequeLink Manager for OS/390. For a list of available Operator Interface commands, see [Appendix C “Operator Interface Commands for OS/390”](#) on page 347.

Operator Interface Requirements

This section lists the configuration requirements that must be met before using the Operator Interface:

RACF requirements:

- The TSOAUTH and OPERCMDS RACF classes must be activated. Use the command:

```
SETROPTS CLASSACT(TSOAUTH OPERCMDS)
```

- The OPERCMDS class must be included in the RACLIST. Use the command:

```
SETROPTS RACLIST(OPERCMDS)
```

- The CONSOLE resource must be defined in the TSOAUTH class. Use the command:

```
RDEF TSOAUTH CONSOLE UACC(NONE)
```

- The OPERPARM segment of the RACF profile of each user of the Operator Interface must include either AUTH=SYS or AUTH=ALL. For example:

```
ALTUSER user-id OPERPARM(AUTH(ALL))
```

where *user-id* is the user ID of the user of the Operator Interface.

- Each user of the Operator Interface must have the following permissions granted:

- Permission to use the TSO console command. Use the command:

```
PERMIT CONSOLE CL(TSOAUTH) ID(user-id) ACCESS(READ)
```

where *user-id* is the user ID of the user for who you are granting permissions.

- Permission to issue operator commands from an MCS-console. Use the command:

```
RDEF OPERCMDS MVS.MCSOPER.user-id UACC(NONE)
PERMIT MVS.MCSOPER.user-id CL(OPERCMDS) ID(user-id)
ACCESS(UPDATE)
```

where *user-id* is the user ID of the user for who you are granting permissions.

NOTE: Update is required because the Operator Interface issues MODIFY commands.

- Refresh the RACLIST. Use the command:

```
SETROPTS RACLIST(OPERCMD5) REFRESH
```

Other requirements:

Make sure that the TSO commands `CONSOLE` and `CONSPROF` run as APF-authorized commands. For more information, refer to the information about the `IKJTSOxx` parmlib member in your IBM documentation.

Starting the Operator Interface

You can start the Operator Interface from the ServerList panel. To start the Operator Interface, type `0` beside the SequeLink Server you want to perform operator commands with; then press `ENTER`. The SequeLink Operator Console panel appears, allowing you to type operator commands at the `Operator command ===>` prompt.

```
Sequelink Operator Console for ACCT1                               Row 1 to 1
of 1                                                                Scroll > PAGE

Enter a command to execute

Operator command ===>

Command output:
-----
Enter a command or press 'F3' to exit...
***** Bottom of data *****
```

Generating JCL

After you create and configure a SequeLink Server for the first time, you must generate JCL to complete the configuration task. The SequeLink Manager customizes JCL obtained from the *SequeLink_HLQ.SKELS* data set and saves the customized output in a server-specific data set named *SequeLink_HLQ.Servename.CNTL*, where *SequeLink_HLQ* is the high-level qualifier identifying the data set.

Generating JCL allows you to easily keep the JCL members synchronized with the actual server configuration.

The following list shows the JCL members that are generated and the tasks they perform. Also, this list notes any tasks you must perform for the JCL member.

- **BIND:** This member binds all required SequeLink packages and plans. The tailored job contains a job-step for each defined DB2 interface and bind statements for all data sources that use this interface.

NOTE: If services, interfaces, or server data sources are added later, or the plan name or collection-prefixes of a data source are changed, you must regenerate and submit this member.

- **CFGPRINT:** A summary member you can use for debugging purposes that reports the content of all variables at the time of JCL generation. This member also lists the user and date and time of the last JCL generation.
- **EVLDEF:** This member creates the event trace file for the server.

- **INIT:** This member contains operator interface commands that will be executed after the successful startup of the server.

NOTE: To add or delete operator interface commands you want to execute after the successful startup of the server, edit this member.

- **RUNSMF:** A sample job that allows SMF records to be printed.
- **RUNSRVR:** This member is the started task or job that is used to start the server.

NOTE: If interfaces are added or deleted later, you must regenerate this member, and stop and start the server.

- **RUNWHAT:** This member is a diagnostic job that prints all versions of the software components and can be used for debugging.

To generate JCL:

- 1 Type **G** beside the SequeLink Server on the ServerList panel; then, press ENTER. The JCL Settings panel appears.

```

DataDirect SequeLink Manager for OS/390 - ServerList          Row 1 to 3 of 3
-----
|
|           DataDirect SequeLink Manager for OS/390 - JCL Settings
|
| Change the default settings used for JCL generation:
|
|   Job prefix . . . . .
|   Job Class  . . . . .
|   Output Class . . . .
|   Accounting Info . .
|   Generate server as:
|       1. Started Task (recommended)
|       2. Normal Job
|
| Press Enter to continue, F12 to cancel dialog.
|
| Command ==>>
|   F1=Help      F3=End      F5=View Err   F12=Cancel
|-----

```

- 2 If you want to change the default settings used for JCL generation, provide the following information:

Job profile: Type the name of the site-specific job name.

Job Class: Type the name of the site-specific job class.

Output Class: Type the name of the site-specific output class.

Accounting Info: Type your site-specific jobcard account information.

- 3 Choose whether to generate the JCL for the server as a started task (recommended) or as a normal job:
 - Type 1 to generate the JCL for the server as a started task; then, press ENTER.
 - Type 2 to generate the JCL for the server as a normal job; then, press ENTER.

8 Configuring SequeLink Services Using the SequeLink Manager for OS/390

OS/390 This chapter describes the tasks that you may need to perform to configure and manage SequeLink services and server data sources locally from an OS/390 machine.

NOTES:

- The server does not have to be offline to change its configuration; however, remember that some configuration changes do not take effect until you restart the server. Also, regeneration of the JCL may be necessary, depending on the changes that are made.
- To delete a service, the server must be offline.

Configuring SequeLink Servers

This section describes how to create and manage SequeLink Servers locally on OS/390.

To do this...

Create a SequeLink Server

Delete a SequeLink Server

See ...

["Creating a SequeLink Server" on page 126](#)

["Deleting a SequeLink Server" on page 129](#)

To do this...	See ...
Define a DB2 interface	"Defining a DB2 Interface" on page 130
Add a UID map	"Adding a UID Map" on page 131

Creating a SequeLink Server

On OS/390, a SequeLink Server definition is a collection of SequeLink services that run in the same address space. You can define multiple SequeLink Servers on the same OS/390 machine. Each SequeLink Server includes a SequeLink Agent service, which is automatically created when you define the SequeLink Server, and one or multiple SequeLink data access services. For example, if you define a SequeLink Server named ACCT1, a SequeLink Agent service is automatically created named ACCT1.

To create a SequeLink Server:

- 1 From the ServerList panel, type A at the Command prompt to create a SequeLink Server; then press ENTER. The Add server panel appears.

```

DataDirect SequeLink Manager for OS/390 - Add server
Complete the following fields for the new server:

Server name . . . . .
Description
Hostname/IP-address
Agent portnumber . . . .

Command ==>
F1=Help      F3=End      F5=View Err  F12=Cancel

```

- 2 Provide the following information; then press ENTER.

Server name: Type the name of the new SequeLink Server definition. The server name you choose must be the same name as the jobname or started task name under which the server will run.

Description: Type a description for the new SequeLink Server definition.

Hostname/IP-address: Type the TCP/IP host name or the TCP/IP address of the SequeLink Server definition. Typically, the TCP/IP address will be the 127.0.0.1 TCP/IP loopback address; however, in some instances, such as when the TSO session for the SequeLink Manager is running on another IP stack than the server, you must specify the TCP/IP address of the server machine.

Agent portnumber: Type the port to be used by the SequeLink Agent.

NOTE: When you create a server, a server-specific configuration file is created. If such a file already exists, you are prompted to confirm whether you want to overwrite the existing configuration file.

3 The ServerList panel shows the SequeLink Server you just created.

```

DataDirect SequeLink Manager for OS/390 - ServerList           Row 1 to 2 of 2

Allowed actions or commands are:

o (S)elect a server      o (D)elete a server
o (A)dd a server        o (O)perator interface
                        o (G)enerate JCL

  Name      Description
-----
  ACCT1     DB2 V6 SERVICE-USING IBM TCP/IP
  SL50B6    DB2 V6 SERVICE-USING IBM TCP/IP
***** Bottom of data *****

Command ==>>>                                           Scroll > PAGE

F1=Help      F3=End      F5=View Err  F7=Up      F8=Down    F10=Left
F11=Right    F12=Cancel

```

Once you have created a SequeLink Server, type **s** beside it to view the server management tree. The server management tree shows DB2 interfaces, UID maps, and SequeLink services and their configuration settings.

For more information about using the server management tree, see [“Using the Server Management Tree” on page 117](#).

Deleting a SequeLink Server

- 1 From the ServerList panel, type **D** beside the SequeLink Server you want to delete; then, press **ENTER**. The Delete server panel appears, prompting you to confirm the deletion.

```

-----
DataDirect SequeLink Manager for OS/390 - Delete server

You are about to delete the following server from the list of known
servers.

Server name . . . . . : ACCT1
Description
DB2 V6 SERVICE          USING IBM TCP/IP
Hostname/IP-address
127.0.0.1
Agent portnumber . . . : 8042
JCL output library . . : SQLNK.SLX2.ACCT1.CNTL
Sequelink config. file : SQLNK.SLX2.ACCT1.SWANDM.INI

Are you sure this is what you want to do ?
2  1. Yes, go ahead.
   2. No, don't delete.

Also delete any data sets used by the server ?
2  1. Yes, delete the data sets.

Command ==>
F1=Help      F3=End      F5=View Err  F12=Cancel
-----

```

- 2 Confirm or cancel the deletion:

- Type **1** to confirm the deletion; then, press **ENTER**.
- Type **2** to cancel the deletion; then, press **ENTER**.

The SequeLink Server is deleted, and you are returned to the list of servers.

Defining a DB2 Interface

- 1 From the server management tree, type A beside the DB2 Interfaces node to add a DB2 interface to the SequeLink Server; then, press ENTER. The Add DB2 interface panel appears.

```

DataDirect SequeLink Manager for OS/390
-----
DataDirect SequeLink Manager for OS/390 - Add DB2 Interface
Enter the parameters for the new interface from server ACCT1 to DB2:
Interface ID . . .                DB2 Subsystem ID
DB2 Version . . .                (eg.:V510)
Description
DB2 Loadlib
DB2 Exitlib
Command ==>
F1=Help      F3=End      F5=View Err  F12=Cancel
-----

```

- 2 Provide the following information; then, press ENTER.

Interface ID: Type the ID that identifies the DB2 Interface, for example, DSN7.

DB2 Version: Type the version of DB2 that will be used.

Description: Type a description of the DB2 interface.

DB2 Loadlib: Type the name of the DB2 load library.

DB2 Exitlib: Type the name of the DB2 exit library.

- 3 You are returned to the server management tree. If the DB2 interface was created successfully, a message appears to confirm it.

NOTE: You must regenerate the JCL and restart the SequeLink Server before this change will take effect.

Adding a UID Map

UID mapping is the mapping of user IDs to alternate user IDs using a UID map. You can use UID mapping to prevent users from updating DB2 tables using commonly available tools, such as QMF or SPUFI, while preserving their ability to update DB2 tables using SequeLink. UID mapping is required when the SequeLink service attributes ServiceAuthMethods=Anonymous and MVSServiceSecurity=SAFNONE. For more information about using UID maps, see [“Using UID Mapping” on page 262](#).

To add a UID map:

- 1 From the server management tree, type **A** beside the UID Maps node to add a UID map to the SequeLink Server; then, press **ENTER**. The Add UID Map panel appears.

```

DataDirect SequeLink Manager for OS/390
-----
DataDirect SequeLink Manager for OS/390 - Add UID Map
|
| Complete the following fields for the new mapping table:
|
| UID Map Name . . . .
| Default access . . . . (PERMIT / DENY)
|
| Description
|
| Command ==>
| F1=Help      F3=End      F5=View Err  F12=Cancel
|-----

```

2 Provide the following information; then, press ENTER.

UID Map Name: Type the name of the UID map you want to add to the SequeLink Server.

Default access: Choose one of the following options for the default behavior of the UID map you are adding:

- **PERMIT.** If the user ID cannot be found in the UID map, the connection request is accepted.
- **DENY.** If the user ID cannot be found in the UID map, the connection request is refused.

Description: Type a description of the UID map.

3 If the UID map was added successfully, a message appears to confirm it.

4 To add mapping entries to the UID map, type s beside the UID map; then, press ENTER. The AttributeList panel appears.

```

DataDirect SequeLink Manager for OS/390
----- DataDirect SequeLink Manager for OS/390 - AttributeList -----
                                                                    Row 1 to 2 of 2
                                                                    MORE >>>

UID Map UIDACCT
Enter the 'ADD'-command to add an attribute or
perform one of the actions below on a specific attribute
o (S)elect    o (C)hange    o (D)elete    o (?)Help

Name                                     Value
-----
MVSUIDDefaultAccess                      PERMIT
MVSUIDMapDescription                      UID map for ACCT1
***** Bottom of data *****

COMMAND ==>>
F1=Help      F3=End      F5=View Err  F7=Up      F8=Down
F10=Left     F11=Right   F12=Cancel

```

- 5 Type `Add` at the Command prompt; then, press ENTER. A panel appears allowing you to specify a UID mapping entry for the MVSUID attribute.

```

DataDirect SequeLink Manager for OS/390
----- Attribute Value -----
|
| Press F1 for help, F3 to leave.
|
| MVSUID
|
|          ===>
|
| F1=Help      F3=End      F5=View Err  F12=Cancel
|
-----

```

- 6 Specify a value for the MVSUID attribute using the format `user=mapped_user` or `*=mapped_user` where:
- `user` is a valid user or user group for the OS/390 security system.
 - `*` represents any user and is required when the SequeLink service attributes `ServiceAuthMethods=Anonymous` and `MVSServiceSecurity=SAFNONE`.
 - `mapped_user` is a valid DB2 authorization ID.

Then, press ENTER.

- 7 You are returned to the AttributeList panel. Add another MVSUID entry or press F3 to return to the server management tree.

For more information about using UID maps, see [“Using UID Mapping” on page 262](#).

Configuring SequeLink Services

This section describes how to create and manage SequeLink services locally on OS/390.

To do this...	See ...
Create a SequeLink service	"Creating a SequeLink Service" on page 134
Delete a SequeLink service	"Deleting a SequeLink Service" on page 137
View service attributes	"Viewing SequeLink Service Attributes" on page 138
Change a service attribute	"Changing a SequeLink Service Attribute" on page 139
Add a service attribute	"Adding a SequeLink Service Attribute" on page 142
Delete a service attribute	"Deleting a SequeLink Service Attribute" on page 144
Configure monitoring	"Configuring Monitoring" on page 146
Configure event tracing	"Configuring Event Tracing" on page 151

Creating a SequeLink Service

NOTE: A SequeLink service must reference a DB2 interface. Before you create a SequeLink service, make sure that you have already defined your DB2 interfaces. To define DB2 interfaces, see ["Defining a DB2 Interface" on page 130](#).

To create a SequeLink service:

- 1 Type A beside the SequeLink Services node to add a service to the SequeLink Server; then, press ENTER. The Add service panel appears.

```

DataDirect SequeLink Manager for OS/390

-----
DataDirect SequeLink Manager for OS/390 - Add service
Command ==>

Complete the following fields for the new service for server ACCT1:

Service name . . . . .
Description
Portnumber . . . . . 0

F1=Help      F3=End      F5=View Err  F12=Cancel

+ ACCT1
+ MVSDB26
+ Service Templates

F1=Help      F3=End      F5=View Err  F7=Up      F8=Down      F10=Left
F11=Right    F12=Cancel

```

- 2 Provide the following information; then, press ENTER.

Service name: Type the name of the new SequeLink service.

Description: Type a description of the SequeLink service you are creating.

Portnumber: Type the port number on which the SequeLink service will be listening for connection requests.

- 3 You are prompted to select a DB2 interface for the SequeLink service you are creating.

```

DataDirect SequeLink Manager for OS/390
----- DataDirect SequeLink Manager for OS/390-----
|                                                                 |
|                                                                 | Row 1 to 1 of 1
| COMMAND ===>                                                | SCROLL > CSR
|                                                                 | MORE >>>
|                                                                 |
| You have to choose a DB2-interface                            |
| for service ACCTDB21                                         |
|                                                                 |
| Use (S) or (/) to select an interface.                       |
|                                                                 |
| Name SubsysId Description                                     |
|-----|-----|-----|
| DSN6 DB6R      DB2 v61                                       |
| ***** Bottom of data *****                               |
|                                                                 |
| F1=Help      F3=End      F5=View Err      F7=Up      F8=Down
| F10=Left     F11=Right   F12=Cancel
|-----|-----|-----|

```

- 4 Type *s* beside the DB2 interface you want this SequeLink service to reference; then, press ENTER. You are returned to the server management tree. If the SequeLink service was created successfully, a message appears to confirm it.

For instructions on changing SequeLink service attributes, see [“Changing a SequeLink Service Attribute” on page 139](#).

NOTE: You must restart the SequeLink Server before this change will take effect.

Deleting a SequeLink Service

- 1 From the server management tree, type **D** beside the SequeLink service you want to delete; then, press **ENTER**. The Delete service panel appears, prompting you to confirm the deletion of the SequeLink service.

```

DataDirect SequeLink Manager for OS/390
----- Attribute Display - Read Only -----
|
| DataDirect SequeLink Manager for OS/390 - Delete service
| Command ===>
|
| You are about to delete the following service from server ACCT1:::::
|
| Service name . . . : DB21
| Description
| ACCT DB2
| Portnumber . . . . : 2050
|
| Are you sure this is what you want to do ?
| 2 1. Yes, go ahead.
|   2. No, don't delete.
|
| F1=Help      F3=End      F5=View Err  F12=Cancel
|-----|-----|-----|-----|-----|-----|
| F1=Help      F3=End      F5=View Err  F7=Up      F8=Down      F10=Left
| F11=Right    F12=Cancel

```

- 2 Confirm or cancel the deletion:

- Type **1** to confirm the deletion; then, press **ENTER**
- Type **2** to cancel the deletion; then, press **ENTER**.

The SequeLink service is deleted, and you are returned to the server management tree.

NOTE: You must restart the SequeLink Server before this change will take effect.

Viewing SequeLink Service Attributes

- 1 From the server management tree, type / beside the Service Settings node of the SequeLink service to expand it. The server management tree shows the attribute categories for the service.
- 2 Type s beside the attribute category for which you want to view attributes; then, press ENTER. The AttributeList panel appears for that category, listing all the attributes and their values.

For example, if you selected the Logging category, the following AttributeList panel appears.

```

DataDirect SequeLink Manager for OS/390
----- DataDirect SequeLink Manager for OS/390 - AttributeList -----
|                                                                 Row 1 to 2 of 2 |
|                                                                 MORE >>> |
| Service ACCT1 |
| Enter the 'ADD'-command to add an attribute or |
| perform one of the actions below on a specific attribute |
| |
| o (S)elect    o (C)hange    o (D)elete    o (?)Help |
| Name          Value |
|-----|
| ServiceDebugLogLevel      1 |
| ServiceDebugLogPath      SQLNK.SLX2.ACCT1.LOG |
| ***** Bottom of data ***** |
| |
| COMMAND ==>>> |
| F1=Help      F3=End      F5=View Err    F7=Up      F8=Down |
| F10=Left     F11=Right   F12=Cancel |
|-----|

```

NOTE: Your screen may not be able to display all attributes at once. Press F7 and F8 to scroll up and down the attribute list.

For information about:

- Adding attributes, see [“Adding a SequeLink Service Attribute” on page 142.](#)
- Changing the value of an attribute, see [“Changing a SequeLink Service Attribute” on page 139.](#)
- Deleting an attribute, see [“Deleting a SequeLink Service Attribute” on page 144.](#)

NOTE: To display help about an attribute, type ? beside the attribute; then, press ENTER.

Changing a SequeLink Service Attribute

- 1 From the server management tree, type / beside the Service Settings node of a SequeLink service to expand it. The server management tree shows the attribute categories for the service.
- 2 Type s beside an attribute category to select it; then, press ENTER. The AttributeList panel appears for that category, listing all the attributes and their values.

For example, if you selected the Logging attribute category, the following AttributeList panel appears.

```

DataDirect SequeLink Manager for OS/390
.----- DataDirect SequeLink Manager for OS/390 - AttributeList -----
|                                                                 Row 1 to 3 of 3 |
| Dialog canceled.                                                                 MORE >>> |
|                                                                 |
| Service MVSDB2                                                                 |
| Enter the 'ADD'-command to add an attribute or                               |
| perform one of the actions below on a specific attribute                     |
| o (S)elect   o (C)hange   o (D)elete   o (?)Help                             |
|                                                                 |
| Name                                                    Value                 |
|-----|-----|
| ServiceDebugLogLevel                                   1                                     |
| ServiceDebugLogPath                                   SQLNK.SLX.ACCT1.LOG                    |
| ServiceEventTraceSize                                  1000000                                |
| ***** Bottom of data *****                               |
|                                                                 |
| COMMAND ===>                                                                 SCROLL > PAGE |
| F1=Help        F3=End          F5=View Err   F7=Up          F8=Down          |
| F10=Left       F11=Right       F12=Cancel   |

```

NOTES:

- Your screen may not be able to display all attributes at once. Press F7 and F8 to scroll up and down the attribute list.
 - To display help about an attribute, type ? beside the attribute; then, press ENTER.
- 3 Type C beside the attribute you want to change; then, press ENTER. The Attribute Display window appears with the cursor positioned at the value field of the attribute.

For example, if you wanted to change the value of the `ServiceDebugLogLevel` attribute to 4 (Debug), the following Attribute Display window appears.

```

DataDirect SequeLink Manager for OS/390
.-- DataDirect SequeLink Manager for OS/390 ---.
|                                     Row 1 to 7 of 7 |
|-----|
| ServiceDebugLogLevel                |
| Bitmask currently in effect:        |
|                                     |
| Use (S) or (/) to select bits to set. |
|                                     |
| Bit description                      |
|-----|
| / Fatal                             |
| Errors                              |
| Warnings                            |
| Informational                       |
| Debug                               |
| SSP Packet Log                     |
| SSP Requests                       |
| COMMAND ==>>                      | SCROLL > PAGE |
| F1=Help                            | F3=End       | F5=View Err |
| F7=Up                              | F8=Down     | F10=Left   |
|-----|

```

- 4 Type the new value of the attribute; then, press ENTER. You are returned to the `Attributelist` panel, and the attribute value, if valid, is changed.
- 5 Press F3 to return to the server management tree.

Adding a SequeLink Service Attribute

- 1 From the server management tree, type / beside the Service Settings node of the SequeLink service to expand it. The server management tree shows the attribute categories for the service.
- 2 Type s beside the attribute category to select it; then, press ENTER. The AttributeList panel appears for that category, listing all the attributes and their values.

For example, if you selected the Logging category, the following AttributeList panel appears.

```

DataDirect SequeLink Manager for OS/390
.----- DataDirect SequeLink Manager for OS/390 - AttributeList -----
|                                                                 Row 1 to 3 of 3 |
| Dialog canceled.                                                                 MORE >>> |
|                                                                 |
| Service MVSDB2                                                                 |
| Enter the 'ADD'-command to add an attribute or                               |
| perform one of the actions below on a specific attribute                     |
| o (S)elect   o (C)hange   o (D)elete   o (?)Help                             |
|                                                                 |
| Name                                               Value                       |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| ServiceDebugLogLevel                             1                               |
| ServiceDebugLogPath                             SQLNK.SLX.ACCT1.LOG              |
| ServiceEventTraceSize                           1000000                         |
| ***** Bottom of data *****                               |
|                                                                 |
| COMMAND ==>                                                                 SCROLL > PAGE |
| F1=Help      F3=End      F5=View Err   F7=Up      F8=Down |
| F10=Left     F11=Right   F12=Cancel   |
|-----|-----|-----|-----|-----|-----|-----|-----|

```

- 3 Type Add at the Command prompt to add an attribute; then, press ENTER. A panel appears listing the attributes you are allowed for that category.

For example, if you wanted to add an attribute to the Logging category, the following panel appears.

```

DataDirect SequeLink Manager for OS/390
.-- DataDirect SequeLink Manager for OS/390 ---.
                                     Row 1 to 2 of 2 |
|
| This is a list of attributes,
| you are allowed to add:
|
| Use (S) or (/) to select an attribute.
|
| Attribute
| -----
| ServiceEventTraceLocation
| ServiceEventTraceSize
| ***** Bottom of data *****
|
| COMMAND ==>                               SCROLL > PAGE
| F1=Help           F3=End           F5=View Err
| F7=Up             F8=Down          F10=Left
| -----

```

NOTES:

- Your screen may not be able to display all attributes at once. Press F7 and F8 to scroll up and down the attribute list.
 - To display help about an attribute, type ? beside the attribute; then, press ENTER.
- 4 Type s beside the attribute you want to add; then, press ENTER. The Attribute Display window appears with the cursor positioned at the value field of the attribute.

NOTE: When you add an attribute, the Value field will display the default value, if a default exists for the attribute. To accept the default, press ENTER.

For example, if you wanted to add the ServiceEventTraceLocation attribute, the following Attribute Display window appears.

```

DataDirect SequeLink Manager for OS/390
----- Attribute Value-----
|
| Press F1 for help, F3 to leave.
|
| ServiceEventTraceLocation
|           ===>
|
| F1=Help      F3=End      F5=View Err  F12=Cancel
|-----|

```

- 5 Type a value for the attribute or use the default if one is available; then, press ENTER.
- 6 You are returned to the AttributeList panel. Press F3 to return to the server management tree.

Deleting a SequeLink Service Attribute

- 1 From the server management tree, type / beside the Service Settings node of the SequeLink service to expand it. The server management tree shows the attribute categories for the service.
- 2 Type s beside the attribute category to select it; then, press ENTER. The AttributeList panel appears for that category, listing all the attributes and their values.

For example, if you selected the Logging category, the following AttributeList panel appears.

```

DataDirect SequeLink Manager for OS/390
.----- DataDirect SequeLink Manager for OS/390 - AttributeList -----
|                                                                 Row 1 to 3 of 3 |
| Dialog canceled.                                                                 MORE >>> |
|
| Service MVSDDB2
| Enter the 'ADD'-command to add an attribute or
| perform one of the actions below on a specific attribute
| o (S)elect   o (C)hange   o (D)elete   o (?)Help
|
| Name                                             Value
|-----|-----|
| ServiceDebugLogLevel                           1
| ServiceDebugLogPath                            SQLNK.SLX.ACCT1.LOG
| ServiceEventTraceSize                          1000000
| ***** Bottom of data *****
|
| COMMAND ==>                                     SCROLL > PAGE
| F1=Help      F3=End      F5=View Err   F7=Up      F8=Down
| F10=Left     F11=Right   F12=Cancel
|-----|-----|

```

- 3 Type **D** beside the attribute you want to delete; then, press **ENTER**. The attribute is deleted.

Configuring Monitoring

SequeLink provides the following levels of monitoring for both SequeLink Agent and SequeLink data access services, listed here from highest-level to lowest-level:

- **Service monitoring** monitors these activities by service:
 - Statistics of received packets and sent packets
 - Sessions started and statements opened
 - Active statements and sessions
 - Fetched rows and affected rows
 - Transactions
- **Session monitoring** monitors these activities by session within a service:
 - Statistics of received packets and sent packets
 - Statements opened and active statements
 - Fetched rows and affected rows
 - Transactions
 - Information about each session, such as start time, client information (network address, data source used by the client, and type of client), native database session identification, and database user
- **Statement monitoring** monitors these activities by statement within a session:
 - Fetched rows and affected rows
 - SQL statements issued

To enable monitoring at one of the listed levels, higher-level monitoring must be enabled. For example, you cannot monitor Session information unless Service monitoring is enabled. Similarly, you cannot monitor Statement information unless both Service monitoring and Session monitoring are enabled.

For information about using the SequeLink Manager Snap-in to monitor SequeLink service activity, see [Chapter 5 “Managing](#)

[Data Access Activity Using the SequeLink Manager Snap-in” on page 89.](#)

To configure monitoring locally on the OS/390:

- 1 From the server management tree of the SequeLink Server, type / beside Configuration node of the SequeLink service for which you want to turn on monitoring; then, press ENTER.
- 2 Type / beside the Profiles node to expand it, if necessary; then, press ENTER.

NOTE: Your screen may not be able to show you the entire server management tree at once. Press F7 and F8 to scroll up and down the server management tree.

The Profiles node lists all monitoring and event tracing profiles enabled for the SequeLink service. You can perform the following actions:

- To add a profile, see [“Creating a Monitoring Profile” on page 148.](#)
- To change a profile, see [“Changing a Monitoring Profile” on page 150.](#)
- To delete a profile, see [“Deleting a Monitoring Profile” on page 151.](#)

Creating a Monitoring Profile

- 1 Type **A** beside the Profiles node to add a profile to the SequeLink service; then, press ENTER. The Add Profile panel appears prompting you to select the type of profile to add.

```
DataDirect SequeLink Manager for OS/390

-----
DataDirect SequeLink Manager for OS/390 - Add Profile
|
| Select type of profile to add:
|
| 1  1. Monitor Profile.
|    2. Event Trace Profile.
|
| Press Enter to continue.
|
| Command ==>
|  F1=Help      F3=End      F5=View Err  F12=Cancel
|-----
```

- 2 Type 1 to add a monitoring profile; then, press ENTER. The Monitor Profile panel appears.

```

----- Attribute Value -----
|
|      DataDirect SequeLink Manager for OS/390 - Monitor Profile
|
| These are the counters and events to be monitored:
|
| / Enable Service Monitoring:
|
|   / received packet size(avg) / statements opened   / active sessions
|   / sent packet size(avg)     / active statements / affected rows
|   / sessions started          / fetched rows     / transactions
|
| / Enable Session Monitoring:
|
|   / received packet size(avg) / active statements / transactions
|   / sent packet size(avg)     / fetched rows     / info
|   / statements opened         / affected rows
|
| / Enable Statement Monitoring:
|
|   / fetched rows              / affected rows    / sql
|
| Command ==>
|   F1=Help      F3=End      F5=View Err  F12=Cancel
|
-----

```

- 3 Type / beside an option to enable it or clear the / to disable an option. When you are satisfied with your settings, press F3. You are returned to the server management tree.
- 4 Restart the SequeLink Server to activate the profile you just created.

Changing a Monitoring Profile

- 1 From the server management tree, type **s** beside the profile you want to change; then, press **ENTER**. The Monitor Profile panel appears.

```

----- Attribute Value -----
|
|   DataDirect SequeLink Manager for OS/390 - Monitor Profile
|
| These are the counters and events to be monitored:
|
| / Enable Service Monitoring:
|
|   / received packet size(avg) / statements opened   / active sessions
|   / sent packet size(avg)     / active statements / affected rows
|   / sessions started          / fetched rows     / transactions
|
| / Enable Session Monitoring:
|
|   / received packet size(avg) / active statements / transactions
|   / sent packet size(avg)     / fetched rows     / info
|   / statements opened         / affected rows
|
| / Enable Statement Monitoring:
|
|   / fetched rows              / affected rows     / sql
|
| Command ==>
|   F1=Help      F3=End      F5=View Err  F12=Cancel
|
-----

```

- 2 Type **/** beside an option to enable it or clear the **/** to disable an option. When you are satisfied with your settings, press **ENTER**.
- 3 Restart the SequeLink Server to activate the monitoring profile you just changed.

Deleting a Monitoring Profile

- 1 From the server management tree, type **D** beside the profile you want to delete; then, press **ENTER**. The profile is deleted.
- 2 Restart the SequeLink Server.

Configuring Event Tracing

Events are generated when the client application accesses data and when specific server activities occur, such as when a service starts or an error occurs. Depending on which SequeLink profiles are active, the information generated with the event is displayed as it occurs in the runtime monitor and is stored persistent in the event trace file.

On OS/390, the event trace file must be created using the EVLDEF member from the server's CNTL library.

For information about using the SequeLink Manager Snap-in for event tracing, see [Chapter 5 "Managing Data Access Activity Using the SequeLink Manager Snap-in" on page 89](#).

To configure event tracing locally on the OS/390:

- 1 From the server management tree, type **/** beside Configuration node of the SequeLink service for which you want to turn on monitoring; then, press **ENTER**.
- 2 Type **/** beside the Profiles node to expand it, if necessary; then, press **ENTER**.

NOTE: Your screen may not be able to show you the entire server management tree at once. Press **F7** and **F8** to scroll up and down the server management tree.

The Profiles node lists all monitoring and event tracing profiles enabled for the SequeLink service. You can perform the following actions:

- To add a profile, see [“Creating an Event Trace Profile” on page 152.](#)
- To change a profile, see [“Changing an Event Trace Profile” on page 154.](#)
- To delete a profile, see [“Deleting an Event Trace Profile” on page 155.](#)

Creating an Event Trace Profile

- 1 From the server management tree, type **A** beside the Profiles node to add a profile to the SequeLink service; then, press **ENTER**. The Add profile panel appears prompting you to select the type of profile you want to add.

```

DataDirect SequeLink Manager for OS/390
-----
DataDirect SequeLink Manager for OS/390 - Add Profile
|
| Select type of profile to add:
|
| 1  1. Monitor Profile.
|    2. Event Trace Profile.
|
| Press Enter to continue.
|
| Command ==>
|   F1=Help      F3=End      F5=View Err  F12=Cancel
|-----

```

- 2 Type 2 to add an event tracing profile; then, press ENTER. The Event Trace Profile panel appears listing the event tracing options available.

```
.DataDirect SequeLink Manager for OS/390
----- DataDirect SequeLink Manager for OS/390 -----
|                                                                 |
|                                                                 | Row 1 to 7 of 26
|                                                                 | MORE >>>
|                                                                 |
| Event Trace Profile for service ACCT1                          |
| Check which events you want to write to the Sequelink Event Trace. |
| Use (S) or (/) to select/unselect an event,                   |
| or use (F) to view or set an event filter.                     |
|                                                                 |
| Trace  Event                                                  |
|-----|
| False  Event processing Starting                               |
| False  Event processing Stopping                              |
| True   Cursor Closed                                          |
| True   Cursor Opened                                          |
| True   Debug Tracing                                          |
| True   Error Internal                                          |
| True   Error Occured                                          |
| COMMAND ===>                                                | SCROLL > PAGE
| F1=Help      F3=End      F5=View Err   F7=Up      F8=Down
| F10=Left    F11=Right   F12=Cancel
|-----|
```

- 3 Type / beside an option to enable it or clear the / to disable an option. When you are satisfied with your settings, press F3.

NOTE: Optionally, you can type F beside an event trace option to define a filter for the option. A panel appears allowing you to set the filter for that event trace option. Type the filter; then, press ENTER. See [“Filtering Events” on page 422](#) for more information about filtering and the syntax of filter statements.

You are returned to the server management tree.

more information about filtering and the syntax of filter statements.

You are returned to the server management tree.

- 3 Restart the SequeLink Server to activate the profile you just changed.

Deleting an Event Trace Profile

- 1 From the server management tree, type **D** beside the profile you want to delete; then, press **ENTER**. The profile is deleted.
- 2 Restart the SequeLink Server.

Configuring Server Data Sources

This section describes how to create and manage server data sources locally using the SequeLink Manager for OS/390.

To do this...	See ...
Create a server data source	"Creating a Server Data Source" on page 156
Delete a server data source	"Deleting a Server Data Source" on page 159
View server data source attributes	"Viewing Server Data Source Attributes" on page 160
Add a server data source attribute	"Adding a Server Data Source Attribute" on page 162

To do this...

Change a server data source attribute

Delete a server data source attribute

See ...

[“Changing a Server Data Source Attribute” on page 166](#)

[“Deleting a Server Data Source Attribute” on page 169](#)

Creating a Server Data Source

When you create a server data source, the attributes for the new server data source are copied from the default data source. Once you create a server data source, you can change any attributes of the new server data source. For instructions on viewing server data source attributes, see [“Viewing Server Data Source Attributes” on page 160](#).

To create a server data source:

- 1 Type / beside the Datasource Settings node of the SequeLink service to expand it; then, press ENTER. The expanded Datasource Settings node shows the default server data source, which is named Default, and any other server data sources defined for the SequeLink service.

```

DataDirect SequeLink Manager for OS/390

Management Tree for server ACCT1
  To see a list of valid actions on a node, type '?' beside it.
  Use '/' to expand or collapse tree branches.
  Valid commands are: EXP SAVE REFRESH ERRSTK
-----
    - Logging
    - Others
    - User Security
  - Datasource Settings
    + Default
  - Profiles
    - Monitoring (Agent)
    - Event Tracing (Agent)

Command ==>>
  F1=Help      F3=End      F5=View Err  F7=Up      F8=Down     Scroll > PAGE
  F11=Right    F12=Cancel

```

- 2 Type A beside the Datasource Settings node; then, press ENTER. The Add Datasource panel appears.

```

DataDirect SequeLink Manager for OS/390
----- Attribute Value -----
|
| DataDirect SequeLink Manager for OS/390 - Add datasource
| Command ==>>
|
| Enter the parameters for the new datasource for service ACCT1 in
| server ACCT1:
|
| Datasource name
|
| Description
|
| F1=Help      F3=End      F5=View Err  F12=Cancel
|-----|-----|-----|-----|
|
| F1=Help      F3=End      F5=View Err  F7=Up      F8=Down      F10=Left
| F11=Right    F12=Cancel

```

- 3 Provide the following information; then, press ENTER.

Datasource name: Type the name of the new server data source.

Description: Type a description for the server data source.

- 4 You are returned to the server management tree, and the panel reminds you to review the attribute settings for the server data source. For instructions on viewing and changing server data source attributes, see [“Viewing Server Data Source Attributes” on page 160](#) and [“Changing a Server Data Source Attribute” on page 166](#).

The server data source you created can be used immediately for incoming connections; you do not need to restart the SequeLink Server.

Deleting a Server Data Source

NOTE: You cannot delete the Default server data source.

- 1 Type / beside the Datasource Settings node of the SequeLink service to expand it; then, press ENTER. The expanded Datasource Settings node shows the default server data source, which is named Default, and any other server data sources defined for the SequeLink service.
- 2 To delete a server data source, type D beside the Datasource Settings node; then, press ENTER. The Delete datasource panel appears prompting you to confirm the deletion.

```

DataDirect SequeLink Manager for OS/390
-----
DataDirect SequeLink Manager for OS/390 - Delete datasource
|
| You are about to delete the following datasource from service ACCT1 in
| server ACCT1:::::
|
| Datasource name
| ACCTNW
| Description
| Data source for accounting NW
|
| Are you sure this is what you want to do ?
| 2  1. Yes, go ahead.
|    2. No, don't delete.
|
| Command ==>
| F1=Help      F3=End      F5=View Err  F12=Cancel
|-----

```

- 3 Confirm or cancel the deletion:

- Type 1 to confirm the deletion; then, press ENTER.
- Type 2 to cancel the deletion; then, press ENTER.

The server data source is deleted, and you are returned to the server management tree.

Viewing Server Data Source Attributes

- 1 Type / beside the Datasource Settings node of the SequeLink service to expand it; then, press ENTER. The expanded Datasource Settings node shows the default server data source, which is named Default, and any other server data sources defined for the SequeLink service.
- 2 Type / beside the server data source you want to view attributes for; then, press ENTER. The server data source node expands to show the data source attribute categories.

```

DataDirect SequeLink Manager for OS/390

Management Tree for server ACCT1
To see a list of valid actions on a node, type '?' beside it.
Use '/' to expand or collapse tree branches.
Valid commands are: EXP SAVE REFRESH ERRSTK
-----
- Datasource Settings
  + Default
- ACCTNW
  - Advanced
  - Application security
  - General
  - Others
  - User Security
  - WorkArounds
- Profiles

Command ==>
F1=Help      F3=End      F5=View Err  F7=Up      F8=Down    F10=Left
F11=Right    F12=Cancel
Scroll > PAGE

```

- 3 Type **s** beside any attribute category to view the attributes set for the server data source; then, press ENTER. The **AttributeList** panel appears, listing all the attributes and their values configured for the server data source.

For example, if you selected the **Advanced** category, the following **AttributeList** panel appears.

```

DataDirect SequeLink Manager for OS/390
----- DataDirect SequeLink Manager for OS/390 - AttributeList -----
                                                                 Row 1 to 2 of 2 |
                                                                 MORE >>> |
|
| DataSource ACCTNW
| Enter the 'ADD'-command to add an attribute or
| perform one of the actions below on a specific attribute
| o (S)elect   o (C)hange   o (D)elete   o (?)Help
|
| Name                                     Value
|-----|-----|
| DataSourceCursorHold                     True
| DataSourceTransactionIsolation            Committed
| ***** Bottom of data *****
|
| COMMAND ==>>                                     SCROLL > PAGE
| F1=Help           F3=End           F5=View Err       F7=Up           F8=Down
| F10=Left          F11=Right          F12=Cancel
|-----|-----|

```

Adding a Server Data Source Attribute

- 1 Type / beside the Datasource Settings node of the SequeLink service to expand it; then, press ENTER. The expanded Datasource Settings node shows the default server data source, which is named Default, and any other server data sources defined for the SequeLink service.
- 2 Type / beside the server data source you want to add an attribute for; then, press ENTER. The server data source node expands to show the data source attribute categories.

```

                                DataDirect SequeLink Manager for OS/390

Management Tree for server ACCT1
  To see a list of valid actions on a node, type '?' beside it.
  Use '/' to expand or collapse tree branches.
  Valid commands are: EXP SAVE REFRESH ERRSTK
-----
- Datasource Settings
  + Default
- ACCTNW
  - Advanced
  - Application security
  - General
  - Others
  - User Security
  - WorkArounds
- Profiles

Command ==>                                Scroll > PAGE
  F1=Help      F3=End      F5=View Err  F7=Up      F8=Down    F10=Left
  F11=Right    F12=Cancel

```

- 3 Type **s** beside any attribute category to view the attributes set for the server data source; then, press ENTER. The **AttributeList** panel appears, listing all the attributes and their values configured for the server data source.

For example, if you selected the **Advanced** category, the following **AttributeList** panel appears.

```

DataDirect SequeLink Manager for OS/390
.----- DataDirect SequeLink Manager for OS/390 - AttributeList -----.
|                                                                 Row 1 to 2 of 2 |
|                                                                 MORE >>> |
|
| DataSource ACCTNW
| Enter the 'ADD'-command to add an attribute or
| perform one of the actions below on a specific attribute
| o (S)elect    o (C)hange    o (D)elele    o (?)Help
|
| Name                                Value
|-----|-----|
| DataSourceCursorHold                True
| DataSourceTransactionIsolation      Committed
| ***** Bottom of data *****
|
| COMMAND ==>                                SCROLL > PAGE
| F1=Help          F3=End          F5=View Err    F7=Up          F8=Down
| F10=Left         F11=Right         F12=Cancel
|-----|-----|

```

- 4 Type Add at the Command prompt to add an attribute. A list of attributes you can add for this attribute category appear.

For example, if you wanted to add an attribute from the Advanced category, the following panel appears.

```

DataDirect SequeLink Manager for OS/390
.-- DataDirect SequeLink Manager for OS/390 ---.
      Row 1 to 4 of 4
|
| This is a list of attributes,
| you are allowed to add:
|
| Use (S) or (/) to select an attribute.
|
| Attribute
| -----
| DataSourceArrayFetchMaxBytes
| DataSourceDisableWarnings
| DataSourceSchemaFilterList
| DataSourceTableTypeFilterList
| ***** Bottom of data *****
|
| COMMAND ===>                SCROLL > PAGE
| F1=Help          F3=End          F5=View Err
| F7=Up            F8=Down        F10=Left
| -----

```

NOTES:

- Your screen may not be able to display all attributes at once. Press F7 and F8 to scroll up and down the attribute list.
 - To display help about an attribute, type ? beside the attribute; then, press ENTER.
- 5 Type s beside the attribute you want to add; then, press ENTER. The Attribute Value panel appears with the cursor positioned on the Value field.

For example, if you wanted to add the `DataSourceArrayFetchMaxBytes` attribute to the server data source, the following panel appears.

```

DataDirect SequeLink Manager for OS/390
----- Attribute Value -----
|
| Press F1 for help, F3 to leave.
|
| DataSourceArrayFetchMaxBytes
|
|          ===> 0          ( 0 - 67108864 )
|
| F1=Help      F3=End      F5=View Err  F12=Cancel
|
-----

```

- 6 Type a value for the attribute or use the default if one is available; then, press ENTER.
- 7 You are returned to the `AttributeList` panel. Press F3 to return to the server management tree.

Changing a Server Data Source Attribute

- 1 Type / beside the Datasource Settings node of the SequeLink service to expand it; then, press ENTER. The expanded Datasource Settings node shows the default server data source, which is named Default, and any other server data sources defined for the SequeLink service.
- 2 Type / beside the server data source to view its attributes; then, press ENTER. The server data source node expands to show the data source attribute categories.

```
DataDirect SequeLink Manager for OS/390
```

```
Management Tree for server ACCT1
```

```
To see a list of valid actions on a node, type '?' beside it.
```

```
Use '/' to expand or collapse tree branches.
```

```
Valid commands are: EXP SAVE REFRESH ERRSTK
```

```
-----
- User Security
- Datasource Settings
+ Default
- ACCTNW
- Advanced
- Application security
- General
- Others
- User Security
- WorkArounds
- Profiles
```

```
Command ==>
```

```
Scroll > PAGE
```

```
F1=Help
```

```
F3=End
```

```
F5=View Err F7=Up
```

```
F8=Down
```

```
F10=Left
```

```
F11=Right
```

```
F12=Cancel
```

- 3 Type **s** beside any attribute category to view the attributes set for the data source; then, press ENTER. The AttributeList panel appears, listing all the attributes and their values configured for the server data source.

For example, if you selected the Advanced category, the following AttributeList panel appears.

```

DataDirect SequeLink Manager for OS/390
----- DataDirect SequeLink Manager for OS/390 - AttributeList -----
                                                                 Row 1 to 2 of 2
                                                                 MORE >>>

DataSource ACCTNW
Enter the 'ADD'-command to add an attribute or
perform one of the actions below on a specific attribute
o (S)elect   o (C)hange   o (D)elete   o (?)Help

Name                                     Value
-----
DataSourceCursorHold                      True
DataSourceTransactionIsolation            Committed
***** Bottom of data *****

COMMAND ==>>
F1=Help      F3=End      F5=View Err  F7=Up      F8=Down
F10=Left     F11=Right   F12=Cancel

```

- 4 Type **s** beside the attribute you want to change; then, press ENTER. The Attribute Display window appears with the cursor positioned at the value field of the attribute.

For example, if you wanted to change the value of the DataSourceCursorHold attribute to FALSE, the following panel appears.

```
                                DataDirect SequeLink Manager for OS/390
                                ----- Attribute Display-----
|
| Press F1 for help, F3 to leave.
|
| DataSourceCursorHold
|           ===> True
|
|
| F1=Help      F3=End      F5=View Err  F12=Cancel
|-----|-----|-----|-----|
```

- 5 Type the new value of the attribute; then, press ENTER. You are returned to the AttributeList panel, and the attribute value, if valid, is changed.
- 6 Press F3 to return to the server management tree.

Deleting a Server Data Source Attribute

- 1 Type / beside the Datasource Settings node of the SequeLink service to expand it; then, press ENTER. The expanded Datasource Settings node shows the default server data source, which is named Default, and any other server data sources defined for the SequeLink service.
- 2 Type / beside the server data source to view its attributes; then, press ENTER. The server data source node expands to show the data source attribute categories.

```

                                DataDirect SequeLink Manager for OS/390

Management Tree for server ACCT1
  To see a list of valid actions on a node, type '?' beside it.
  Use '/' to expand or collapse tree branches.
  Valid commands are: EXP SAVE REFRESH ERRSTK
-----
    - User Security
    - Datasource Settings
      + Default
    - ACCTNW
      - Advanced
      - Application security
      - General
      - Others
      - User Security
      - WorkArounds
    - Profiles

Command ==>
  F1=Help      F3=End      F5=View Err  F7=Up      F8=Down     F10=Left
  F11=Right    F12=Cancel
  
```

- 3 Type **s** beside any attribute category to view the attributes set for the data source; then, press ENTER. The AttributeList panel appears, listing all the attributes and their values configured for the server data source.

For example, if you selected the Advanced category, the following AttributeList panel appears.

```

DataDirect SequeLink Manager for OS/390
.----- DataDirect SequeLink Manager for OS/390 - AttributeList -----
|                                                                 Row 1 to 2 of 2 |
|                                                                 MORE >>> |
|
| DataSource ACCTNW
| Enter the 'ADD'-command to add an attribute or
| perform one of the actions below on a specific attribute
| o (S)elect   o (C)hange   o (D)elele   o (?)Help
|
| Name                                     Value
|-----|-----
| DataSourceCursorHold                     True
| DataSourceTransactionIsolation           Committed
| ***** Bottom of data *****
|
| COMMAND ==>                                     SCROLL > PAGE
| F1=Help      F3=End      F5=View Err   F7=Up      F8=Down
| F10=Left     F11=Right   F12=Cancel
|-----|-----

```

- 4 Type **D** beside the attribute you want to delete; then, press ENTER. The attribute is deleted. You are returned to the server management tree.

SMF Accounting

The SequeLink Server on OS/390 writes accounting records to the SMF data sets on your request. The records contain statistical data that can be used to track information for charge-back systems. The following data is provided for each database session:

- Job/STC name of the server
- Client logon ID
- Internal Thread ID assigned by SequeLink Server
- Session start/end times
- Number of packets and bytes received/sent
- Total CPU consumption
- Service name
- Application loadmodule name
- Network node name of the client
- Thread abend/abort information
- Abend code
- Number of SQL calls, checkpoint calls, and DB2 OPEN calls
- Accumulated CPU consumption and elapsed time for SQL calls

The records are written to the active SMF data set using the SMF record ID you specified using the `MVSGlobalSMFRecordType` attribute, which is a Global Settings attribute of the SequeLink Server. If you do not want to use the accounting facility, you can turn it off by deleting the attribute.

The following example shows a typical SMF record. A sample job (RUNSMF) to print out the SMF records is provided in the SequeLink_HLQ.CNTL library.

```
*****
*                               SMF RECORD HEADER
*****
SMFRECORD  DS      0F
SMFRECLEN  DS      H      RECORD LENGTH
SMFDESC    DS      H      DESCRIPTOR (MUST BE ZERO)
SMFSYS     DS      X      SYSTEM INDICATOR (SET TO ZERO)
SMFTYPE    DS      X      RECORD TYPE (SET FROM SIL)
SMFTIME    DS     AL4     CURRENT TIME
SMFDATE    DS     AL4     CURRENT DATE
SMFSID     DS     CL4     SYSTEM ID
SMFSUBS    DS     CL4     SERVER SUBSYSTEMID OR BLANKS
SMFUSER    DS     0X     START OF SUBTYPE FIELD(S)
*
*****
*          SUBTYPE X'0001' - SESSION ACCOUNTING RECORD
*****
@ACCTREC   DSECT
@ACCTLEN   DS     XL2     Accounting Record Length
@ACCTTYP   DS     XL2     Subtype (X'0001')
*
@ACCTJNM   DS     CL8     SERVER JOB/STC/NAME
@ACCTUID   DS     CL8     RACF Userid connected to thread
@ACCTTID   DS     CL8     Threadid
@ACCTAPL   DS     CL8     Application Name
@ACCTSVCS  DS     CL8     ServiceName
@ACCTNOD   DS    CL16     Client NodeName (TCP/IP address)
@ACCTCNT   DS     F      Message Count
@ACCTBIN   DS     F      Total Input Message byte count
@ACCTBOT   DS     F      Total Output Message byte count
*
* Session Start - Time and date ( SMF format )
*
@ACCTBGT   DS     F      Time since Midnight in 100th of second
@ACCTBGD   DS    PL4     Date in 0CYDDDDF format - C is 1 if year is 20YY,
                        is 0 if 19YY
```

```

*
* Session Ending - Time and date ( SMF format )
*
@ACCTENT DS    F      Time since Midnight in 100th of second
@ACCTEND DS    PL4    Date in 0CYYDDDF format - C is 1 if year is 20YY,
                       is 0 if 19YY
@ACCTCPU DS    F      CPU TIME used - measured in 100th of a second
@ACCTERR DS    X
*          1          Thread abended - abend code in @ACCTABN
*          2          Aborted for Idletime reason
*          4          Aborted by Operator
*          8          Aborted for MaxCPU reason
*
@ACCTABN DS    XL3    Left 12 bits - Systemabend code in Hex
*                               Right 12 bit - Userabend code in Hex
*
* The following fields are DB2-specific and are not used other services
*
@ACCTDBC DS    F      Database Calls - count
@ACCTDBO DS    F      Database Opens - count
@ACCTCKP DS    F      Database Checkpoints - count
@ACCTSQC DS    F      Accum SQL CPU time in 100th of seconds
@ACCTSQE DS    F      Accum SQL Elapsed time in 100th of seconds

```

```
*****
```

```
SMF RECORD HEADER
```

```
*****
```

```

SMFRECORD DS    OF
SMFRECLN DS    H      Record length
SMFDESC  DS    H      Descriptor (must be zero)
SMFSYS   DS    X      System indicator (set to zero)
SMFTYPE  DS    X      Record type (set from SYSINI)
SMFTIME  DS    AL4    Current time
SMFDATE  DS    AL4    Current date
SMFSID   DS    CL4    Host system ID
SMFSUBS  DS    CL4    Server subsystem ID (set from SYSINI)
SMFSUBTYP DS   OX     Start of subtype field(s)

```

```

*****
SUBTYPE X'0001' - SESSION ACCOUNTING RECORD
*****
@ACCTLEN  DS    XL2      Accounting record length
@ACCTTYP  DS    XL2      Accounting record subtype (X'0001')
@ACCTUID  DS    CL8      Client logon (user) ID
@ACCTTID  DS    CL8      Thread ID
@ACCTAPL  DS    CL8      Application name (or loadmodule)
@ACCTSVC  DS    CL64     Service name
@ACCTCPU  DS    F        CPU time in hundredths/second
@ACCTCNT  DS    F        Message count
@ACCTBIN  DS    F        Input packet byte count
@ACCTBOT  DS    F        Input packet byte count
@ACCTDBC  DS    F        Database calls
@ACCTBEG  DS    F        Session start time (hhmmssth)
@ACCTEND  DS    F        Session stop time (hhmmssth)
@ACCTNOD  DS    CL16     Client node name
@ACCTDBO  DS    F        DB2 reconnects (thread management)
@ACCTCKP  DS    F        DB2 checkpoints (thread management)
@ACCTSQC  DS    F        Total SQL call CPU time (in microseconds)

```

Part 2: Configuring and Managing SequeLink Clients

This part contains the following chapters:

- [Chapter 9 “Configuring the SequeLink ODBC Client” on page 177](#) describes the tasks that you may need to perform to configure and manage the SequeLink ODBC Client.
- [Chapter 10 “Configuring the SequeLink ADO Client” on page 203](#) describes the tasks that you may need to perform to configure and manage the SequeLink ADO Client.
- [Chapter 11 “Configuring the SequeLink Java Client” on page 227](#) describes the tasks that you may need to perform to configure and manage the SequeLink Java Client.

9 Configuring the SequeLink ODBC Client

This chapter describes the tasks that you may need to perform to configure and manage the SequeLink ODBC Client.

Using the ODBC Administrator



The first step in setting up an ODBC connection is creating an ODBC data source. The ODBC Administrator is installed automatically when you install the SequeLink ODBC Client on Windows. You use the ODBC Administrator to create and manage ODBC data sources.

To start the ODBC Administrator, click **Start**, then **Programs**. From the Programs menu, select **SequeLink ODBC Client 5.1**, and then select the **ODBC Administrator** application. The ODBC Data Source Administrator window appears listing resident data sources.

NOTE: An ODBC Administrator does not exist for UNIX; you must edit the `odbc.ini` file using a text editor. For instructions on creating ODBC client data sources for UNIX, see ["Configuring ODBC Client Data Sources on UNIX"](#) on page 193.

Configuring ODBC Client Data Sources on Windows

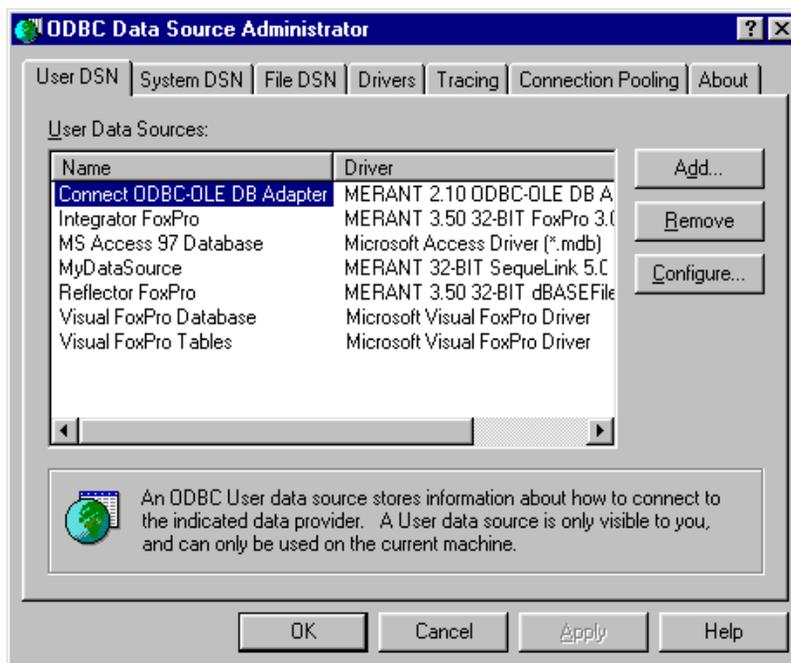


To configure client data sources for the SequeLink ODBC Client on Windows platforms, you use the ODBC Administrator.

Configuring ODBC User and System Client Data Sources

- 1 Start the ODBC Administrator. To start the ODBC Administrator, select **Start / Programs**. From the Programs menu, select **SequeLink ODBC Client 5.1**, and then select the **ODBC Administrator** application.

Click the **User DSN** tab or the **System DSN** tab to list user or system data sources, respectively.



- 2 To configure a new data source, click the **Add** button. A list of installed drivers appears. Select **MERANT 32-BIT SequeLink 5.1**; then, click **Finish**.

NOTE: To change an existing data source, select the data source you want to configure and click the **Configure** button.

The ODBC SequeLink Driver Setup window appears.

- 3 Provide the following information; then, click **OK**.

Data Source Name: Type a unique name that identifies this ODBC data source configuration. Examples include “Accounting” or “SequeLink to Oracle Data.”

Description: Optionally, type a description of the data source. For example, “My Accounting Database” or “Accounting Data in Oracle.”

SequeLink Server Host: Type the TCP/IP host name of the SequeLink service to which you want the SequeLink ODBC Client to connect.

SequeLink Server Port: Type the TCP/IP port the SequeLink service is listening on for incoming connection requests. The port you specify must be the same as the one that was specified for the SequeLink service when the SequeLink Server was installed; the default is 19996.

Server Data Source: Type the name of a server data source configured for the SequeLink service to use for the connection or select one from the drop-down list. This field is optional. If a server data source is not specified, the default server data source for that SequeLink service will be used for the connection.

Translate: Click **Translate** to select a translator. The Select Translator dialog box appears, listing the translators specified in the ODBC Translators section of the system information. SequeLink provides a translator named "OEM TO ANSI" that translates your data from the IBM PC character set to the ANSI character set. Select a translator; then, click **OK** to close this dialog box and perform the translation.

NOTE FOR LDAP USERS: To configure the SequeLink ODBC Client to retrieve connection information from a LDAP directory, select the **Use LDAP** check box. The fields change on the lower half of the screen to accommodate the information that is required to query a LDAP server for connection information. Provide the following information:

LDAP Server Host: Type the TCP/IP host name of the LDAP server.

LDAP Server Port: Type the TCP/IP port the LDAP server is listening on for incoming connection requests. If unspecified, the SequeLink ODBC Client will use the default LDAP port 389.

Distinguished Name (DN): Type an identifier that uniquely identifies the LDAP entry where connection information is stored.

For more information about retrieving connection information from LDAP directories, see [Appendix A, "Using LDAP with SequeLink ODBC and ADO Clients,"](#) on page 305.

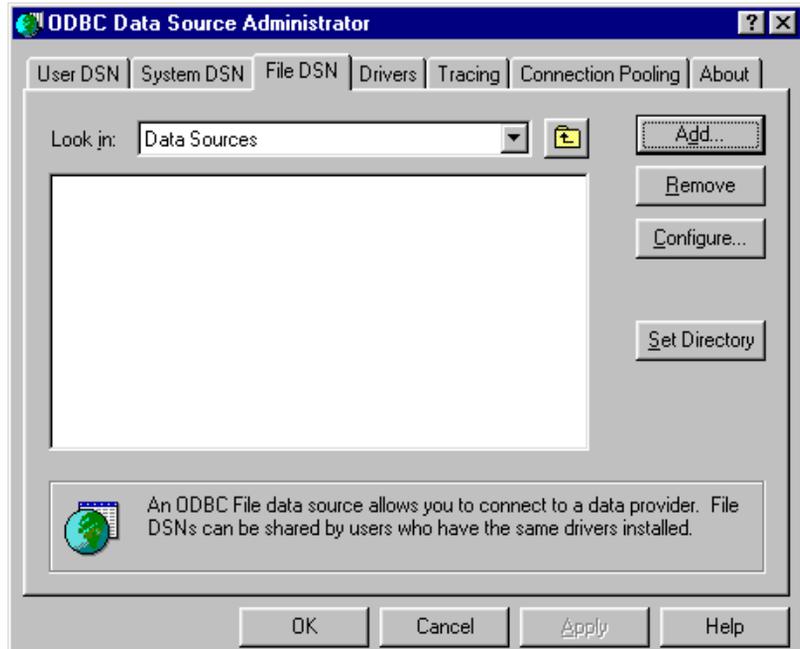
Configuring ODBC File Client Data Sources

File data sources are data source files that can be stored on a file server, making the files available to any user who can access them.

To configure ODBC file client data sources:

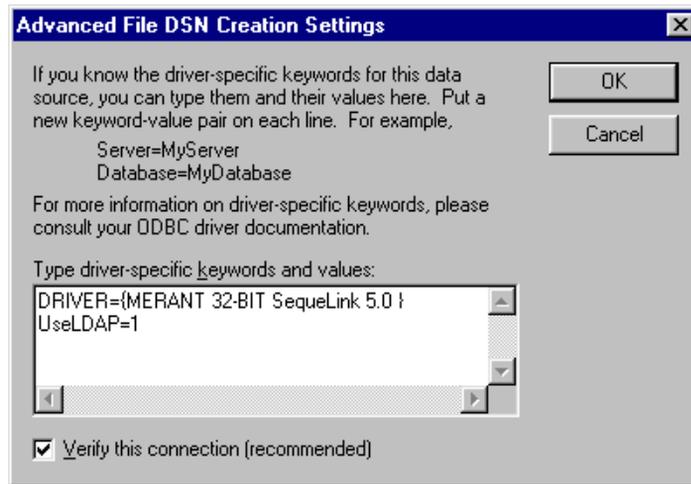
- 1 Start the ODBC Administrator by clicking **Start**, then **Programs**. From the Programs menu, select **SequeLink ODBC Client 5.1**, and then select the **ODBC Administrator** application.

- 2 Click the **File DSN** tab. The File DSN tab lists any file data sources in the specified directory.



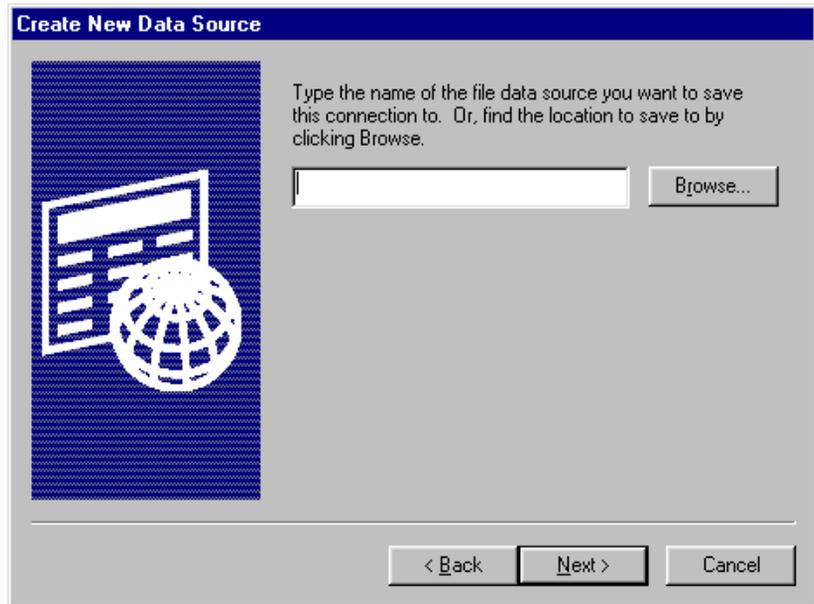
- 3 To configure a new data source, click the **Add** button. A list of installed drivers appears. Select **MERANT 32-BIT SequeLink 5.1**; then, perform one of the following actions:
 - To configure the file data source to connect directly to a SequeLink Server without retrieving connection information from an LDAP directory, click **OK**. Then, skip to [Step 5](#).
 - To configure the file data source to retrieve connection information from an LDAP directory, continue with the next step.

- 4 Click **Advanced**. The Advanced File DSN Creation Settings window appears.



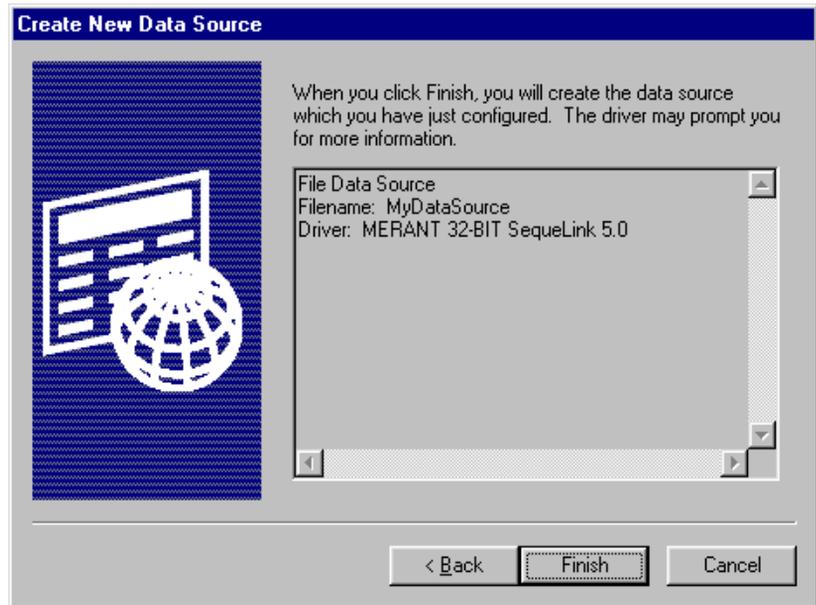
Type `UserLDAP=1` in the Type driver-specific keywords and values scrollable box; then, click **OK**. You are returned to the list of drivers. Click **Next** and continue with [Step 5](#).

- 5 The Create New Data Source window appears.



Type the name of the file data source you want to create or click **Browse** to select an existing file data source; then, click **Next**.

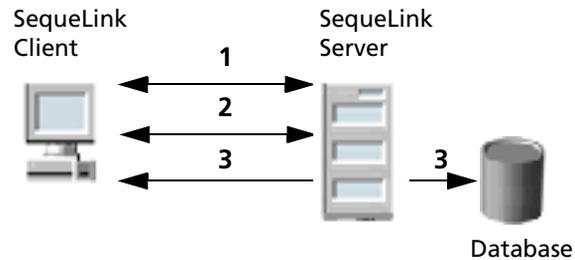
- 6 The Create New Data Source displays the settings you've configured for this data source.



- 7 Click **Finish** to create the file data source. A series of connection dialogs appear as described in "[ODBC Connection Dialogs](#)" on page 186. The file data source will be saved after you enter the correct information in the connection dialogs.

ODBC Connection Dialogs

A SequeLink data access connection involves the following stages:



- 1 A network connection is established.
- 2 An authentication mechanism is used to establish the identity of the SequeLink Client to the SequeLink Server.
- 3 Based on information provided by the SequeLink Client application (for example, a database user name and password), a database connection is established.

Stage 1: Establishing a Network Connection

The first stage of the connection process involves establishing a network connection. The dialog that appears depends on whether the connection has been configured to connect directly to a SequeLink service or to retrieve connection information for the SequeLink service from a centralized LDAP directory.

Connecting Directly to a SequeLink Service

If the connection has been configured to connect directly to a SequeLink service, the Connect to the SequeLink Server dialog appears:



The screenshot shows a dialog box titled "Connect to the SequeLink Server". It has a standard Windows-style title bar with a close button (X) in the top right corner. The dialog contains three input fields on the left and two buttons on the right. The first input field is labeled "SequeLink Server Host:" and contains the text "sparky". The second input field is labeled "SequeLink Server Port:" and contains the text "19996". The third input field is labeled "Server Data Source:" and is a drop-down menu with a downward-pointing arrow. To the right of the first two input fields is an "OK" button, and to the right of the third input field is a "Cancel" button.

Provide the following information; then, click **OK**.

SequeLink Server Host: Type the TCP/IP host name of the SequeLink service.

SequeLink Server Port: Type the TCP/IP port on which the SequeLink service is listening. A default installation of SequeLink Server uses the port 19996.

Server Data Source: Type the name of a server data source to use for the connection or select one from the drop-down list. This step is optional. If a server data source is not specified, the default server data source for that service will be used for the connection.

Retrieving Connection Information from an LDAP Directory

If the connection has been configured to connect to an LDAP server to retrieve connection information from an LDAP directory, the Connect to the SequeLink Server dialog appears:



The screenshot shows a dialog box titled "Connect to the SequeLink Server". It has a standard Windows-style title bar with a close button (X) in the top right corner. The dialog contains three text input fields stacked vertically. The first field is labeled "LDAP Server Host" and contains the text "sparky". The second field is labeled "LDAP Server Port" and is empty. The third field is labeled "Distinguished Name" and is empty. To the right of the first field is an "OK" button, and to the right of the second field is a "Cancel" button.

Provide the following information; then, click **OK**.

LDAP Server Host: Type the TCP/IP host name of the LDAP server.

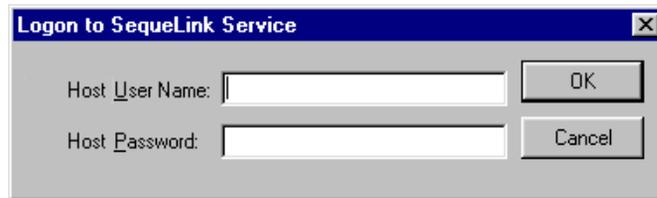
LDAP Server Port: Type the TCP/IP port on which the LDAP server is listening.

Distinguished Name: Type the Distinguished Name (DN) of the LDAP entry.

Stage 2: SequeLink Server Authentication

The second stage of the connection process involves authentication of the SequeLink Client to the SequeLink Server. The dialogs that appear depend on how authentication is configured for the SequeLink service.

- When ServiceAuthMethods=anonymous or ServiceAuthMethods=integrated_nt, no dialogs appear.
- When ServiceAuthMethods=OSLogon(HUID,HPWD) or ServiceAuthMethods=OSLogon(UID,PWD), the Logon to SequeLink Service dialog appears:



Provide the following information; then, click **OK**.

Host User Name: Type the host user name.

NOTE: When connecting to a Windows NT server, you must prefix the host user name with a server name, if authenticating to a local server, or a domain name (for example, SALES\DJONES). If the server name or domain name is omitted, the SequeLink Server will attempt to authenticate the user ID and password with the database account defined for the machine on which the SequeLink Server is running. If this validation fails, the SequeLink Server will attempt to authenticate the user ID and password with the database account defined for the domain of the machine on which the SequeLink Server is running.

Host Password: Type the host password.

- When ServiceAuthMethods=OSLogon(HUID,HPWD,NPWD) or ServiceAuthMethods=OSLogon(UID,PWD,NPWD) and the

password is expired, the Logon to SequeLink service dialog appears:

NOTE: If the password is not expired, the previously described dialog appears, prompting only for the host user name and host password.

Provide the following information; then, click **OK**.

Host User Name: Type the host user name.

NOTE: When connecting to a Windows NT server, you must prefix the host user name with a server name, if authenticating to a local server, or a domain name (for example, SALES\DJONES). If the server name or domain name is omitted, the SequeLink Server will attempt to authenticate the user ID and password with the database account defined for the machine on which the SequeLink Server is running. If this validation fails, the SequeLink Server will attempt to authenticate the user ID and password with the database account defined for the domain of the machine on which the SequeLink Server is running.

Host Password: Type the host password.

New Password: Type the new password to be used by the SequeLink password change mechanism.

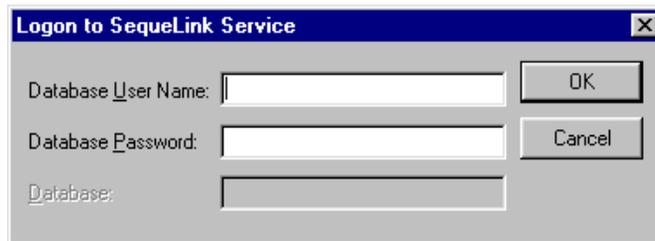
Confirm Password: Type again the new password to confirm it.

For more information about configuring authentication, see [Chapter 12 “Configuring SequeLink Security” on page 241](#).

Stage 3: Data Store Logon

The last stage of the connection process involves logging on the data store. The dialogs that appear depend on the data store logon method configured for the SequeLink service:

- When `DataSourceLogonMethod=OSIntegrated`, no dialogs appear.
- When `DataSourceLogonMethod=DBMSLogon(UID,PWD)` or `DataSourceLogonMethod=DBMSLogon(DBUID,DBPWD)`, a data store-specific user name and password are required and the Logon to SequeLink Service dialog appears:



Provide the following information; then, click **OK**.

Database User Name: Type the database logon ID.

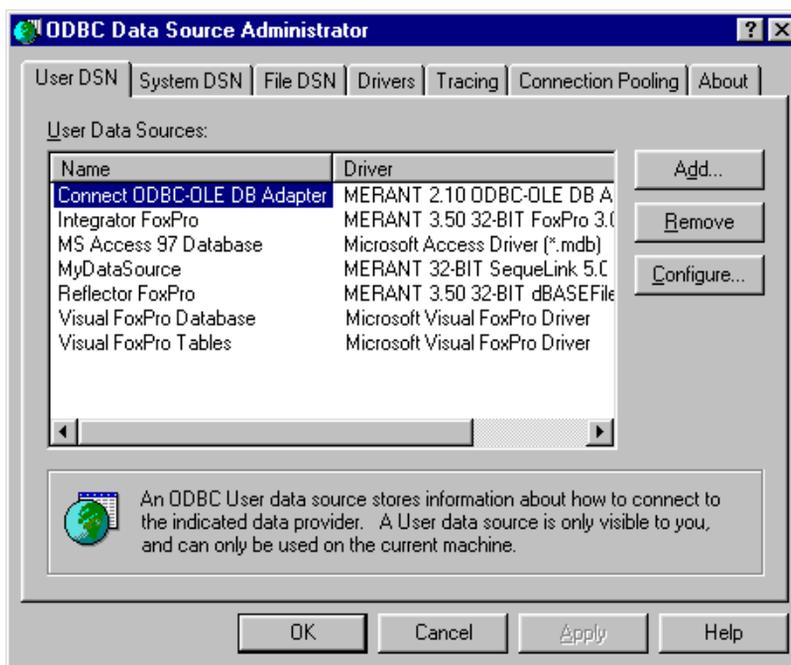
Database Password: Type the database password.

Database: Type the name of the database to which you want to connect. This field is disabled when the data store does not recognize the concept of databases.

For more information about configuring data store logon methods, see [Chapter 12 “Configuring SequeLink Security” on page 241](#).

Testing ODBC Connections on Windows

- 1 On the SequeLink Client, start the ODBC Administrator. To start the ODBC Administrator, select **Start / Programs**. From the Programs menu, select **SequeLink ODBC Client 5.1**, and then select the **ODBC Administrator** application. The ODBC Data Source Administrator window appears listing resident data sources.



NOTE: An ODBC Administrator does not exist for UNIX. To create and manage ODBC data sources, you must edit the `odbc.ini` file using a text editor. For more information about the `odbc.ini`, see [“Configuring ODBC Client Data Sources on UNIX” on page 193](#).

- 2 Create an ODBC data source as described in [“Configuring ODBC Client Data Sources on Windows” on page 178](#), specifying the TCP/IP address and TCP/IP port of the SequeLink service.

- 3 Click the **Test Connect** button to test the connection. If successful, a dialog appears telling you the connection was successful. You are now ready to start using your ODBC applications with SequeLink.

Configuring ODBC Client Data Sources on UNIX



For UNIX, an ODBC Administrator does not exist. This section describes how to configure the `odbc.ini` file and how to set some required environment variables to use the SequeLink ODBC Client on UNIX.

Configuring `odbc.ini` Files

To configure an ODBC data source for UNIX, you must edit the `odbc.ini` file using the attributes in [Table 9-1](#). The `odbc.ini` file accepts only long names for attributes.

ODBC Data Source Attributes for UNIX

NOTE: To configure an ODBC data source for UNIX, you must edit the `odbc.ini` file using the attributes in [Table 9-1](#).

Table 9-1. ODBC Attributes for `odbc.ini`

Attribute	Description
DistinguishedName (DN)	The distinguished name identifying the LDAP entry from which connection information is retrieved. This attribute is required when <code>UseLDAP=1</code> .

Table 9-1. ODBC Attributes for *odbc.ini* (cont.)

Attribute	Description
Host	<p>The TCP/IP address of the SequeLink Server, specified in dotted format or as a host name.</p> <p>LDAP: If LDAP is enabled, this identifies the TCP/IP address of the LDAP server. This can also be a list of LDAP servers separated by a blank space (for example, "ld1.foo.com ld2.foo.com ld3.foo.com"). If the first LDAP server in the list does not respond, the SequeLink ODBC Client will try to connect to the next LDAP server in the list.</p>
LogonID	The host or data store user name, which may be required depending on the server configuration.
Password	The host or data store password, which may be required depending on the server configuration.
Port	<p>The TCP/IP port on which the SequeLink Server is listening.</p> <p>LDAP: If LDAP is enabled, this identifies the TCP/IP port on which the LDAP server is listening. If you do not specify a port, the default port for LDAP (389) will be used.</p>
ServerDataSource	A string that optionally identifies the server data source to be used for the connection. If not specified, the configuration of the default server data source will be used for the connection.
UseLDAP	<p>UseLDAP={0 1}. Determines whether the parameters to establish a connection to the SequeLink Server should be retrieved from LDAP.</p> <p>When set to 0 (the initial default), the SequeLink Client will connect directly to the specified SequeLink Server.</p> <p>When set to 1, the SequeLink ODBC Client will retrieve the TCP/IP host, TCP/IP port, and SequeLink data source (optional) from an LDAP entry identified by a Distinguished Name (DN). Once the connection information is retrieved, the SequeLink Client will connect directly to the specified SequeLink Server. The DistinguishedName (DN) attribute is required.</p>

Example: odbc.ini for Solaris

The following code shows an example of an odbc.ini file for a SequeLink ODBC Client installed on a Solaris machine.

```
[ODBC Data Sources]
DataSourceName=MERANT 32-BIT SequeLink 5.1

[DataSourceName]
Driver=path_of_installdir/lib/ivslk14.so
Description=MERANT 32-BIT SequeLink 5.1
Host=
Port=
UseLDAP=0
DistinguishedName=
[ODBC]
Trace=0
TraceFile=odbctrace.out
TraceDll=path_of_installdir/lib/odbctrace.so
InstallDir=path_of_installdir
```

where *path_of_installdir* is the path to the SequeLink ODBC Client installation directory.

Setting Environment Variables

You must set several environment variables for the SequeLink ODBC Client on UNIX by executing a shell script located in the installation directory.

To execute the shell script:

- If you are using the Bourne or Korn shell, type:

```
. .sqlnk.sh
```

- If you are using the C shell, type:

```
source .sqlnk.csh
```

Executing this shell script sets the following environment variables:

ODBCINI	Specifies where the centralized <code>odbc.ini</code> file is located.
SQLNK_ODBC_HOME	Specifies the full path of the directory containing the SequeLink ODBC Client shared libraries.
LD_LIBRARY_PATH (Solaris)	Specifies the library search path so that the ODBC Driver Manager components and drivers can be located.
SHLIB_PATH (HP-UX)	
LIBPATH (AIX)	

Using a Centralized `odbc.ini` File

Because UNIX is a multi-user environment, you may want to use a single centralized `odbc.ini` file controlled by a system administrator. To do this, set the `ODBCINI` environment variable to point to the fully qualified pathname of the centralized file.

For example:

- In the Bourne or Korn shell:

```
ODBCINI=/opt/odbc/system_odbc.ini;export ODBCINI
```

- In the C shell:

```
setenv ODBCINI /opt/odbc/system_odbc.ini
```

The `odbc.ini` also requires a `[ODBC]` section that includes the `InstallDir` keyword. The value of the `InstallDir` keyword must be the path to the directory that contains the `/lib` and `/messages` directories. For example, if you choose the default installation

directory, the following line must be in the [ODBC] section of the `odbc.ini` file:

```
InstallDir=/usr/slodbc51
```

Connecting Using a Connection String

If your application requires a connection string to connect to a data source, you must specify the data source name that tells the driver which data source to use for the default connection information. Optionally, you may specify *attribute=value* pairs in the connection string to override the default values stored in the data source.

You can specify long or short names in the connection string, which has the format:

```
DSN=data_source_name[;attribute=value[;attribute=value] ...]
```

For example, a connection string for *SequeLink* may look like this:

```
DSN=Accounting;DB=EMP;UID=JOHN;PWD=XYZZY
```

or

```
DSN=Accounting;DB="X:IV;EMP";UID=JOHN;PWD=XYZZY
```

NOTE: If the database name (DB) contains a semicolon (;), you must place the name in quotes, as shown in the example above.

For a list of ODBC connection attributes and their valid values, refer to the *SequeLink Developer's Reference*.

Importing and Exporting ODBC Client Data Sources



The SequeLink Data Source SyncTool allows you to export ODBC client data source definitions to data source files and distribute them to multiple end users. The SequeLink Data Source SyncTool provides two user implementations, one for the SequeLink administrator and another for the end user:

- The SequeLink ODBC Data Source SyncTool Administrator is used by the SequeLink administrator to create data source files. It can import and export data sources. This tool should be made available to the SequeLink administrator only.
- The SequeLink ODBC Data Source SyncTool is used by the end user and can import data sources only. It should be installed on every SequeLink ODBC Client.

In addition, you can create a customized, installable image of SequeLink ODBC Client with predefined, site-specific settings, including data source files created with the SequeLink Data Source SyncTool. This customized, installable image is called a *Quick Install image*. For more information about creating Quick Install images, refer to the *SequeLink Installation Guide*.

The window title bar of the SequeLink Data Source SyncTool indicates whether you, or the end user, is performing an export or an import operation. Also, context-sensitive online help is available by clicking ? on the title bar; then, clicking the area about which you want more information.

Exporting ODBC Client Data Sources

1 From the SequeLink program manager group, double-click the **ODBC Data Source SyncTool Administrator** icon. The SequeLink ODBC Data Source SyncTool Administrator Welcome window appears.

2 Select the **Manage Data Sources Files** option; then, click **Next**.

3 Select a data source file from the Filename list box, or click **Browse** to find a data source file not listed. The default extension for a data source file is .DSF.

To create a new data source file, Click **New**.

4 Select whether you want to export User or System data sources to the data source file you selected; then click **Next**.

5 Select the data sources you want to export to the data source file.

NOTE: You cannot export grayed-out data sources, which are data sources that are configured for a previous incompatible version of the SequeLink ODBC Driver.

6 Using the following symbols, verify that the appropriate actions will be performed on the data sources in the data source file; then, click **Next**.

- The data source will remain unchanged.
- The data source will be added to the data source file.
- The data source will be deleted from the data source file.
- The data source will be updated in the data source file.

7 Type a description for the data source file; then, click **Next**. This description will appear when the end user selects this file for importing.

8 Select the mode the end user will use to import these data sources; then, click **Next**.

- *Interactive mode* allows the user to select which of the data sources in this file will be imported. This mode is not supported by the Quick Install feature. The Quick Install feature supports only data source files created with the Merge or Overwrite options. For more information about creating Quick Install images, refer to the *SequeLink Installation Guide*.
 - *Merge mode* adds or updates all the data sources in the data source file without deleting other data sources.
 - *Overwrite mode* adds or updates the data sources in the data source file and deletes any other data sources configured for the SequeLink ODBC Driver.
- 9 Select the option that will determine how the end user will be able to import the data sources you exported to the data source file; then, click **Next**.
- *Suggest SequeLink User DSN*. When imported, the SequeLink ODBC Data Source SyncTool will suggest to the end user that these data sources be imported as User data sources, but will allow them to be imported as User or System data sources.
 - *Suggest SequeLink System DSN*. When imported, the SequeLink ODBC Data Source SyncTool will suggest to the end user that these data sources be imported as System data sources, but will allow them to be imported as User or System data sources.
 - *Force SequeLink User DSN*. When imported, the SequeLink ODBC Data Source SyncTool will allow these data sources to be imported as User data sources only.
 - *Force SequeLink System DSN*. When imported, the SequeLink ODBC Data Source SyncTool will allow these data sources to be imported as System data sources only.
- 10 Click **Finish** to quit.

Importing ODBC Client Data Sources

The SequeLink administrator and end user use a different implementation of the SequeLink ODBC Data Source SyncTool to import ODBC data source definitions.

To import ODBC client data sources:

1 From the SequeLink program manager group, double-click the appropriate ODBC SyncTool icon. The Welcome window appears.

2 Select the **Import** option, and click **Next**.

NOTE: If using the SequeLink ODBC Data Source SyncTool Administrator, select the **Import Data Sources** option; then, click **Next**.

3 Select a data source file from the Filename list box, or click **Browse** to find a data source file not listed. The default extension for data source files is .DSF.

4 Indicate whether you want to import the data sources in the data source file you just selected as User or System data sources; then, click **Next**.

5 Verify that the appropriate actions will be performed on the data sources on your local machine; then, click **Next**. Depending on the import mode that was set when the data source file was exported, you may see the following symbols:

-  The data source will remain unchanged.
-  The data source will be added to your local machine.
-  The data source will be deleted from your local machine.
-  The data source will be updated to your local machine.

NOTE: Grayed-out data sources are data sources that are configured for a previous incompatible version of the SequeLink ODBC Driver; these data sources will remain unchanged unless you update them in Interactive mode with

a data source configured for the current version of the SequeLink ODBC Driver.

- 6 Click **Finish** to quit.

10 Configuring the SequeLink ADO Client

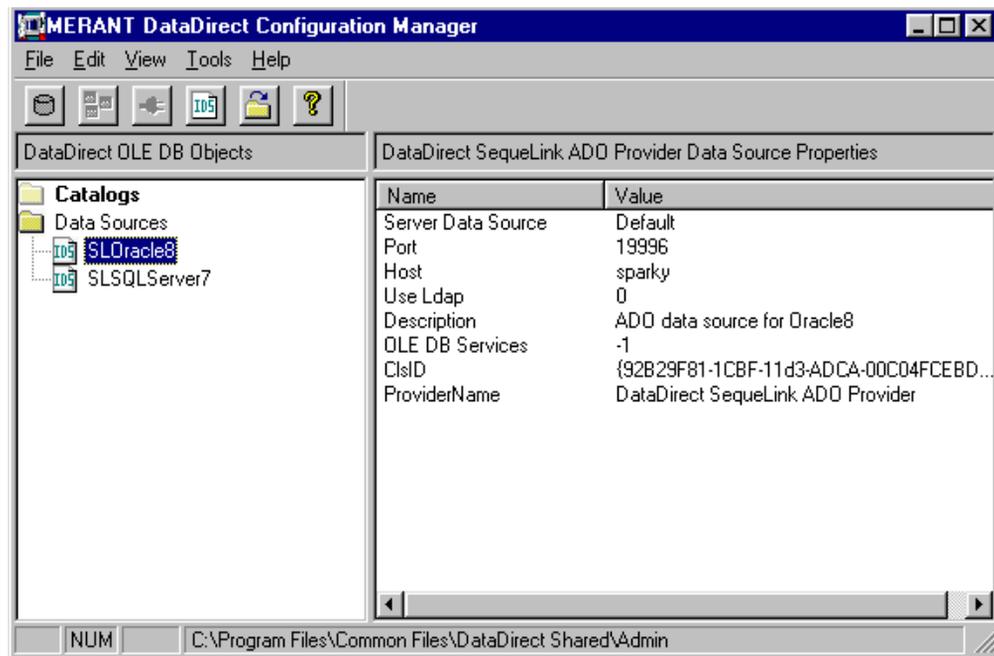
This chapter describes the tasks that you may need to perform to configure and manage the SequeLink ADO Client.

Using the MERANT DataDirect Configuration Manager

To create and configure data sources for the SequeLink ADO Client, you use the MERANT DataDirect Configuration Manager.

To start the Configuration Manager, select **Start / Programs**, and select **SequeLink ADO Client 5.1**. Then, select the **MERANT DataDirect Configuration Manager** application.

The MERANT DataDirect Configuration Manager window is divided into two panes. As [Figure 10-1 on page 204](#) shows, the left pane displays a folder containing defined ADO data sources. When you select a data source, the right pane displays the properties for the selected data source.

Figure 10-1. MERANT DataDirect Configuration Manager

Double-click the **Data Sources** folder to display any existing ADO data sources. The Configuration Manager displays the SequeLink ADO data sources contained in the current directory, which is shown in the status bar at the bottom of the Configuration Manager. The first time you start the Configuration Manager, the current directory defaults to the \Program Files\Common Files\DataDirect Shared\Admin directory.

Working with the DataDirect Configuration Manager

[Table 10-1](#) summarizes the parts and functions of the Configuration Manager that you use with SequeLink ADO data sources.

NOTE: Options that are not supported by the SequeLink ADO Provider are disabled in the toolbar and are omitted from this description.

Table 10-1. DataDirect Configuration Manager: Parts and Functions for SequeLink ADO Data Sources

Use this element...		To do this...
Toolbar		Create new data sources.
		Change the current directory.
		View online help.
Menu Bar	File	<ul style="list-style-type: none"> ■ Create a new data source. ■ Exit from the DataDirect Configuration Manager.
	Edit	<ul style="list-style-type: none"> ■ Delete a data source. ■ Rename a data source. ■ Modify a data source.

Shortcut Tip: Right-clicking an item in the left pane displays a pop-up menu that allows you to perform the same actions that are available from the toolbar and menu bar.

Table 10-1. DataDirect Configuration Manager: Parts and Functions for SequeLink ADO Data Sources (cont.)

Use this element...	To do this...
View	<ul style="list-style-type: none"> ■ View or hide the toolbar and status bar. ■ Refresh the MERANT Configuration Manager.
Tools	Options (change current directory)
Help	View online help.
Vertical splitter bar	Click on the bar and drag it to the right or left to change the size of the left and right panes.
Status bar	<ul style="list-style-type: none"> ■ Show the current keyboard state, including when Num Lock, Scroll Lock, and Caps Lock are turned on. ■ Show the current directory.

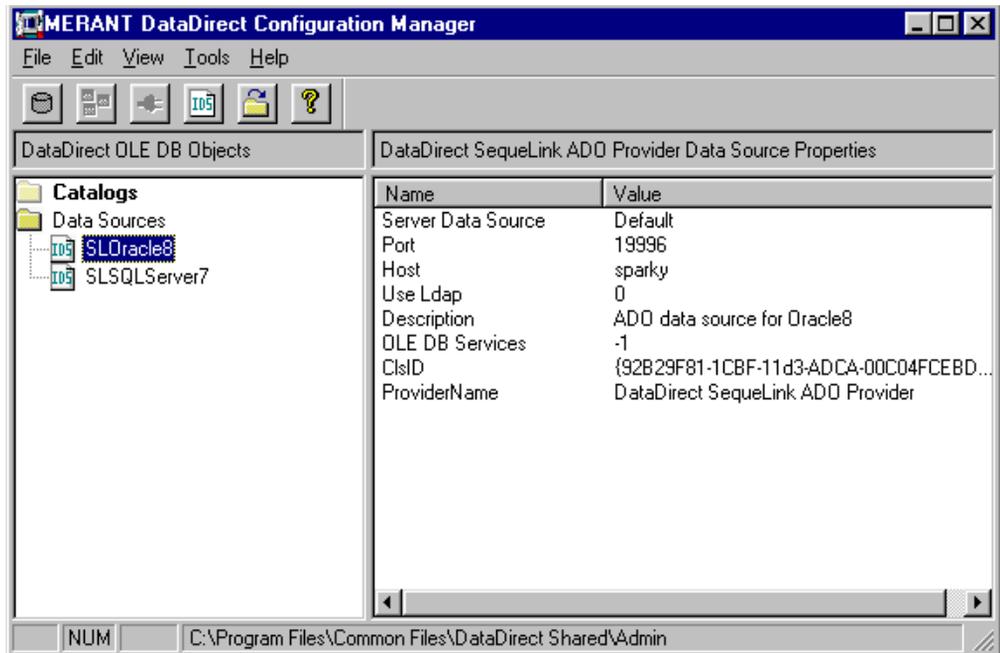
Shortcut Tip: Right-clicking an item in the left pane displays a pop-up menu that allows you to perform the same actions that are available from the toolbar and menu bar.

Displaying Data Source Properties

- 1 Start the Configuration Manager. To start the Configuration Manager, select **Start / Programs**, and select **SequeLink ADO Client 5.1**. Then, select the **MERANT DataDirect Configuration Manager** application.
- 2 Double-click the **Data Sources** folder to display any existing ADO data sources.

- 3 Highlight a data source in the list. The properties of the data source display in the right pane. For example, [Figure 10-1](#) shows the properties of an ADO data source named SLOracle8 displayed in the right pane.

Figure 10-2. MERANT DataDirect Configuration Manager: Displaying Data Source Properties



You can right-click a data source in the left pane to display a pop-up menu. The pop-up menu offers the same actions for the item that are available from the Edit menu.

To display a setup window for an existing data source, double-click an ADO data source in the Data Sources folder.

To create a new data source, highlight the **Data Sources** folder; then, select **File / New / Data Source** from the menu bar.

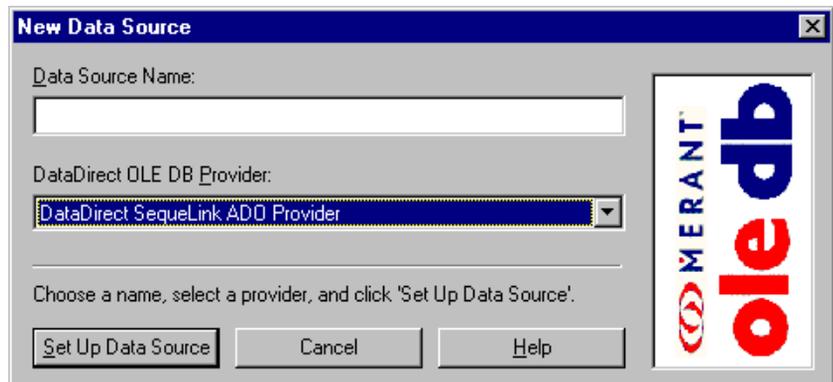
Configuring ADO Client Data Sources

The following sections provide instructions for configuring ADO client data sources:

- “Creating an ADO Client Data Source” on page 208
- “Modifying an ADO Client Data Source” on page 211
- “Renaming an ADO Client Data Source” on page 211
- “Deleting an ADO Client Data Source” on page 212
- “Changing Data Source Directories” on page 212
- “Copying an ADO Client Data Source” on page 213

Creating an ADO Client Data Source

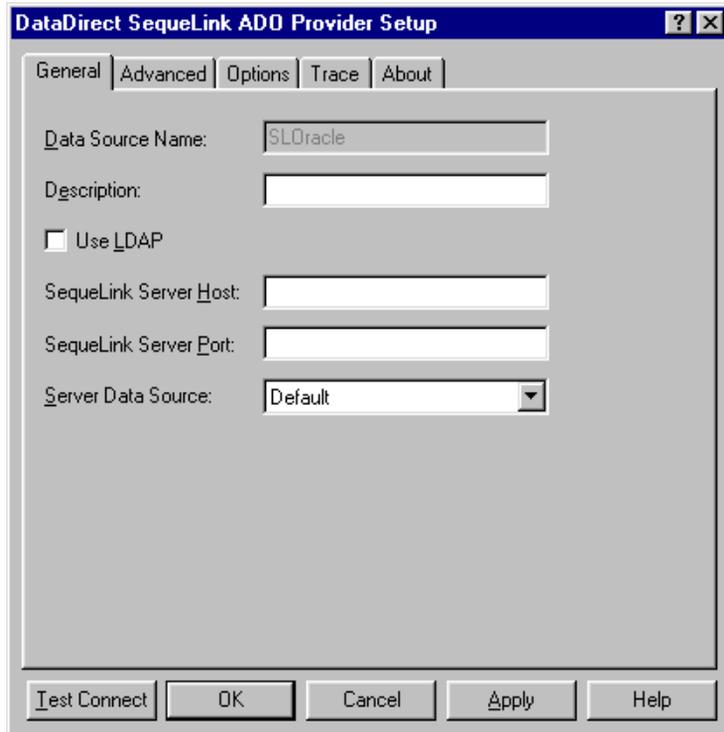
- 1 Start the DataDirect Configuration Manager. To start the Configuration Manager, select **Start / Programs**, and select **SequeLink ADO Client 5.1**. Then, select the **MERANT DataDirect Configuration Manager** application.
- 2 Select **File / New / Data Source** from the menu bar. The New Data Source window appears.



- 3 Type a name for the data source. All data sources located in the same directory must have unique names. If the name has

already been used for another data source, you will be prompted to enter a different name.

- 4 In the DataDirect OLE DB Providers drop-down list, select **DataDirect SequeLink ADO Provider**.
- 5 Click the **Set Up Data Source** button. The DataDirect SequeLink ADO Provider Setup window appears.



NOTE: The General tab displays only fields that are required for creating a data source. The fields on all other tabs are optional, unless noted otherwise.

- 6 Provide the following information.

Data Source Name: This is a read-only field that uniquely identifies this ADO data source configuration. Examples include "Accounting" or "SequeLink to Oracle Data."

Description: Optionally, type a description of the data source. For example, "My Accounting Database" or "Accounting Data in Oracle."

SequeLink Server Host: Type the TCP/IP host name of the SequeLink service to which you want the SequeLink ADO Client to connect. This field is available only if the Use LDAP check box is **not** selected.

SequeLink Server Port: Type the TCP/IP port the SequeLink service is listening on for incoming connection requests. The port you specify must be the same as the one that was specified for the SequeLink service when the SequeLink Server was installed; the default is 19996. This field is available only if the Use LDAP check box is **not** selected.

Server Data Source: Type the name of a server data source configured for the SequeLink service to use for the connection or select one from the drop-down list. This field is optional. If a server data source is not specified, the default server data source for that SequeLink service will be used for the connection. This field is available only if the Use LDAP check box is **not** selected.

NOTE FOR LDAP USERS: To configure the SequeLink ADO Client to retrieve connection information from an LDAP directory, select the **Use LDAP** check box. The fields change on the lower half of the screen to accommodate the information that is required to query an LDAP server for connection information. Provide the following information:

LDAP Server Host: Type the TCP/IP host name of the LDAP server.

LDAP Server Port: Type the TCP/IP port on which the LDAP server is listening for incoming connection requests. If unspecified, the SequeLink ADO Client will use the default LDAP port 389.

Distinguished Name (DN): Type an identifier that uniquely identifies the LDAP entry where connection information is stored.

For more information about retrieving connection information from LDAP directories, see [Appendix A, "Using LDAP with SequeLink ODBC and ADO Clients,"](#) on page 305.

NOTE: All data sources are saved to the current directory displayed in the Configuration Manager. For instructions on changing the current directory, see ["Changing Data Source Directories"](#) on page 212.

Modifying an ADO Client Data Source

To modify the properties of a data source, double-click the data source in the Data Sources folder of the Configuration Manager to display the SequeLink ADO Provider Setup window. See ["Creating an ADO Client Data Source"](#) on page 208 for a description of the fields you can change.

Renaming an ADO Client Data Source

You can rename data sources. You cannot rename or delete the Data Sources folder.

To rename a SequeLink ADO Provider data source:

- 1 Start the Configuration Manager. To start the Configuration Manager, select **Start / Programs**, and select **SequeLink ADO Client 5.1**. Then, select the **MERANT DataDirect Configuration Manager** application.
- 2 Select the data source you want to rename.

- 3 Select **Edit / Rename**. The data source name becomes an editable field.
- 4 Type the new name of the data source and press ENTER.

Deleting an ADO Client Data Source

- 1 Start the Configuration Manager. To start the Configuration Manager, select **Start / Programs**, and select **SequeLink ADO Client 5.1**. Then, select the **MERANT DataDirect Configuration Manager** application.
- 2 Select the data source you want to delete.
- 3 Select **Edit / Delete**.
- 4 A window appears prompting you to confirm the deletion. Click **Yes** to delete the selected data source.

Changing Data Source Directories

The Configuration Manager displays the SequeLink ADO data sources contained in the current directory, which is displayed in the status bar at the bottom of the Configuration Manager. The first time you start the Configuration Manager, the current directory defaults to the SequeLink ADO Client installation directory.

To change the current directory:

- 1 Click the **Change Current Directory** button on the tool bar.
- 2 Type the name of the new directory in the text field, or, click the **Browse** button to select a different directory.
- 3 Click **OK**.

After you change the current directory, the left pane of the Configuration Manager is automatically refreshed to display the data sources in the new directory.

The current directory remains active until you change it again. Any data sources you create are saved to the current directory.

Copying an ADO Client Data Source

Copying a data source can make it easier for you to configure new data sources that use the same properties as existing data sources. When you copy a data source, the copied data source retains all the properties of the original data source. After copying, you can modify the properties of the data source as needed.

To copy a data source:

- 1 In Windows Explorer, navigate to the directory that contains the data source you want to copy. All SequeLink ADO Provider data sources use .IDS as their file extension. For example, if the data source name appears as TEST in the Configuration Manager, the name of the data source file is TEST.IDS.

NOTE: The directory location of a data source displayed in the Configuration Manager appears in the status bar at the bottom of the Configuration Manager.

- 2 Copy the data source to the Windows Explorer clipboard; then, perform one of the following actions:
 - To copy to a different directory, navigate to the directory you want to copy to and paste the data source in that new directory. You can use the same data source name.
 - To copy to the same directory, paste the data source; then, rename the data source to a *unique* name. The copied data source will not be recognized by the

Configuration Manager unless you rename it with a name that is not used by any other the data sources in the directory.

- 3 To display the new data source in the Configuration Manager, perform one of the following actions:
 - If you copied the data source to a different directory, make that directory the current directory in the Configuration Manager by selecting **Tools / Options / Change current directory**. The new data source appears in the Data Sources folder.
 - If you copied the data source to the same directory and renamed the data source, select **View / Refresh** in the Configuration Manager. The new data source appears in the Data Sources folder.

Testing ADO Connections

You can connect to a data source using a Connection window, or using a provider string. For information about connecting using an ADO provider string, refer to the *SequeLink Developer's Reference*.

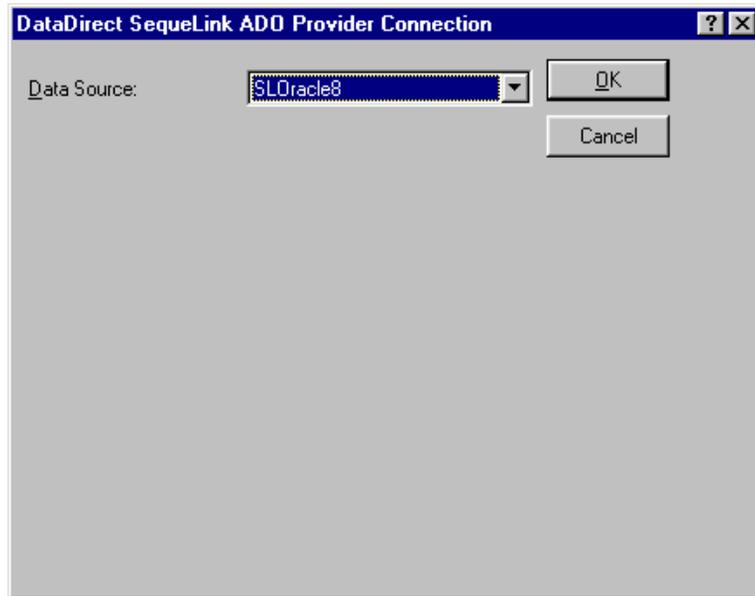
The SequeLink ADO Provider opens a Connection window when you perform either of the following actions:

- You request a connection to a SequeLink ADO Provider from within your data consumer, and your data consumer requests the SequeLink ADO Provider to prompt for missing connection parameters.
- You click **Test Connect** in a SequeLink ADO Provider setup window to test the connection to a data source you have set up.

For more information about ADO connection dialogs that may appear, see [“ADO Connection Dialogs” on page 215](#).

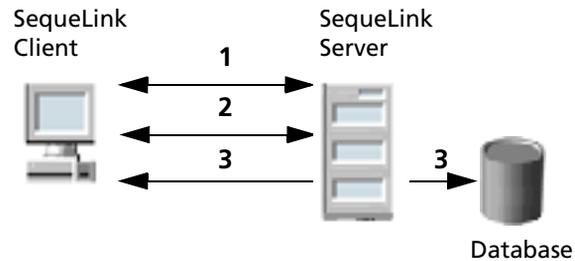
ADO Connection Dialogs

When your data consumer requests the SequeLink ADO Provider to prompt for missing connection parameters and an ADO data source has not been specified, the DataDirect SequeLink ADO Provider Connection window appears.



Select the data source that you want to use from the drop-down list. If you do not want to specify a data source name, select **None** from the drop-down list. In some cases, the data source name may be supplied automatically. Then, click **OK**.

The other connection dialogs that may appear involve prompting for information required to make a SequeLink data access connection. A SequeLink data access connection involves the following stages:



- 1 A network connection is established.
- 2 An authentication mechanism is used to establish the identity of the SequeLink Client to the SequeLink Server.
- 3 Based on information provided by the SequeLink Client application (for example, a database user name and password), a database connection is established.

Stage 1: Establishing a Network Connection

The first stage of the connection process involves establishing a network connection. The dialog that appears depends on whether the connection has been configured to connect directly to a SequeLink service or to retrieve connection information for the SequeLink service from a centralized LDAP directory.

Connecting Directly to a SequeLink Service

If the connection has been configured to connect directly to a SequeLink service, the following window appears:



The screenshot shows a dialog box titled "Connect to the SequeLink Server". It has a standard Windows-style title bar with a close button (X). The dialog contains three input fields: "SequeLink Server Host" with the text "sparky", "SequeLink Server Port" with the text "19996", and "Server Data Source" which is a drop-down menu. To the right of the "SequeLink Server Host" field is an "OK" button, and to the right of the "SequeLink Server Port" field is a "Cancel" button.

Provide the following information; then, click **OK**.

SequeLink Server Host: Type the TCP/IP host name of the SequeLink service.

SequeLink Server Port: Type the TCP/IP port on which the SequeLink service is listening. A default installation of SequeLink Server uses the port 19996.

Server Data Source: Type the name of a server data source to use for the connection or select one from the drop-down list. This step is optional. If a server data source is not specified, the default server data source for that service will be used for the connection.

Retrieving Connection Information from an LDAP Directory

If the connection has been configured to connect to an LDAP server to retrieve connection information from an LDAP directory, the following window appears:



Provide the following information; then, click **OK**.

LDAP Server Host: Type the TCP/IP host name of the LDAP server.

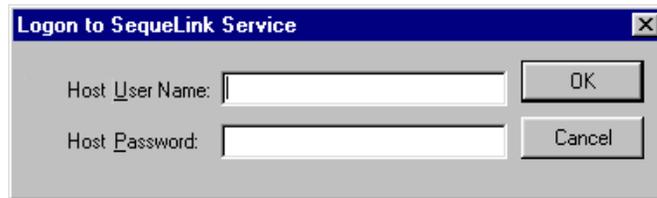
LDAP Server Port: Type the TCP/IP port on which the LDAP server is listening.

Distinguished Name: Type the Distinguished Name (DN) of the LDAP entry.

Stage 2: SequeLink Server Authentication

The second stage of the connection process involves authentication of the SequeLink Client to the SequeLink Server. The dialogs that appear depend on how authentication is configured for the SequeLink service.

- When ServiceAuthMethods=anonymous or ServiceAuthMethods=integrated_nt, no dialogs appear.
- When ServiceAuthMethods=OSLogon(HUID,HPWD) or ServiceAuthMethods=OSLogon(UID,PWD), the following dialog appears:



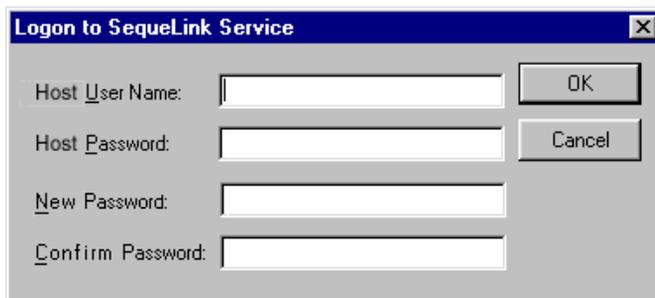
Provide the following information; then, click **OK**.

Host User Name: Type the host user name.

NOTE: When connecting to a Windows NT server, you must prefix the host user name with a server name, if authenticating to a local server, or a domain name (for example, SALES\DJONES). If the server name or domain name is omitted, the SequeLink Server will attempt to authenticate the user ID and password with the database account defined for the machine on which the SequeLink Server is running. If this validation fails, the SequeLink Server will attempt to authenticate the user ID and password with the database account defined for the domain of the machine on which the SequeLink Server is running.

Host Password: Type the host password.

- When `ServiceAuthMethods=OSLogon(HUID,HPWD,NPWD)` or `ServiceAuthMethods=OSLogon(UID,PWD,NPWD)` and the password is expired, the following dialog appears:



NOTE: If the password is not expired, the previous dialog appears. You are only prompted for the Host User Name and Host Password.

Provide the following information; then, click **OK**.

Host User Name: Type the host user name.

NOTE: When connecting to a Windows NT server, you must prefix the host user name with a server name, if authenticating to a local server, or a domain name (for example, SALES\DJONES). If the server name or domain name is omitted, the SequeLink Server will attempt to authenticate the user ID and password with the database account defined for the machine on which the SequeLink Server is running. If this validation fails, the SequeLink Server will attempt to authenticate the user ID and password with the database account defined for the domain of the machine on which the SequeLink Server is running.

Host Password: Type the host password.

New Password: Type the new password to be used by the SequeLink password change mechanism.

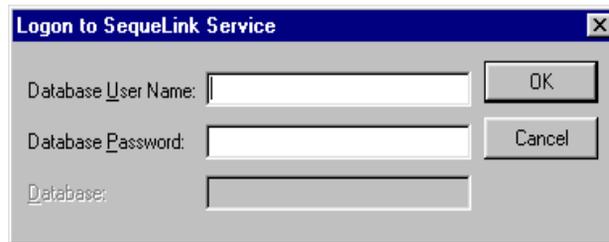
Confirm Password: Type again the new password to confirm it.

For more information about configuring authentication, see [Chapter 12 “Configuring SequeLink Security” on page 241](#).

Stage 3: Data Store Logon

The last stage of the connection process involves logging on the data store. The dialogs that appear depend on the data store logon method configured for the SequeLink service:

- When `DataSourceLogonMethod=OSIntegrated`, no dialogs appear.
- When `DataSourceLogonMethod=DBMSLogon(UID,PWD)` or `DataSourceLogonMethod=DBMSLogon(DBUID,DBPWD)`, a data store-specific user name and password are required and the following dialog appears:



Provide the following information; then, click **OK**.

Database User Name: Type the database logon ID.

Database Password: Type the database password.

Database: Type the name of the database to which you want to connect. This field is disabled when the data store does not recognize the concept of databases.

For more information about configuring data store logon methods, see [Chapter 12 “Configuring SequeLink Security” on page 241](#).

Connecting with a Provider String

Once a data source is defined through the DataDirect Configuration Manager and the SequeLink ADO Provider Setup Assistant, your application can connect directly to that data source. You can override the current settings for the data source when you connect using a *provider string*.

A provider string contains *attribute=value* pairs that control various aspects of the data provider's connection and interaction with the database. When an application names a specific data source to connect to, the application can also pass the data provider a provider string of *attribute=value* pairs. The data provider uses the values in the provider string instead of the default values defined for the data source in the system information.

Using provider strings allows application developers to configure connections for users programmatically and ensures that users have the optimum settings for working with the provider and database. Any values a user has set for a data source through the DataDirect Configuration Manager are overridden by corresponding values in the provider string for the current session only.

The provider string sets the DBPROP_INIT_PROVIDERSTRING initialization property and has the form:

```
"attribute=value;attribute=value;"
```

For a list of ADO connection attributes, refer to the *SequeLink Developer's Reference*.

Importing and Exporting ADO Client Data Sources



The SequeLink Data Source SyncTool allows you to export ADO client data source definitions to data source files and distribute them to multiple end users. The SequeLink Data Source SyncTool provides two user implementations, one for the SequeLink administrator and another for the end user:

- The SequeLink ADO Data Source SyncTool Administrator is used by the SequeLink administrator to create data source files. It can import and export data sources. This tool should be made available to the SequeLink administrator only.
- The SequeLink ADO Data Source SyncTool is used by the end user and can import data sources only. It should be installed on every SequeLink ADO Client.

In addition, you can create a customized, installable image of SequeLink ADO Client with predefined, site-specific settings, including data source files created with the SequeLink Data Source SyncTool. This customized, installable image is called a *Quick Install image*. For more information about creating Quick Install images, refer to the *SequeLink Installation Guide*.

The window title bar of the SequeLink Data Source SyncTool indicates whether you, or the end user, is performing an export or an import operation. Also, context-sensitive online help is available by clicking ? on the title bar; then, clicking the area about which you want more information.

Exporting ADO Client Data Sources

- 1 From the SequeLink program manager group, double-click the **ADO Data Source SyncTool Administrator** icon. The

SequeLink ADO Data Source SyncTool Administrator Welcome window appears.

- 2 Select the **Manage Data Sources Files** option; then, click **Next**.
- 3 Select a data source file from the Filename list box, or click **Browse** to find a data source file not listed. The default extension for data source files is .OSF.

To create a new data source file, click **New**.

- 4 Select whether you want to export User or System data sources to the data source file you selected; then click **Next**.
- 5 Select the data sources you want to export to the data source file.

NOTE: You cannot export grayed-out data sources, which are data sources that are configured for a previous incompatible version of the SequeLink ADO Provider.

- 6 Using the following symbols, verify that the appropriate actions will be performed on the data sources in the data source file:
 -  The data source will remain unchanged.
 -  The data source will be added to the data source file.
 -  The data source will be deleted from the data source file.
 -  The data source will be updated in the data source file.
- 7 Type a description for the data source file; then, click **Next**. This description will appear when the end user selects this file for importing.
- 8 Select the mode the end user will use to import these data sources; then, click **Next**.
 - *Interactive mode* allows the user to select which of the data sources in this file will be imported. This mode is not supported by the Quick Install feature. The Quick Install feature supports only data source files created with the Merge or Overwrite options. For more information about

creating Quick Install images, refer to the *SequeLink Installation Guide*.

- *Merge mode* adds or updates all the data sources in the data source file without deleting other data sources.
 - *Overwrite mode* adds or updates the data sources in the data source file and deletes any other data sources configured for the SequeLink ADO Provider.
- 9 Select the option that will determine how the end user will be able to import the data sources you exported to the data source file; then, click **Next**.
- *Suggest SequeLink User DSN*. When imported, the SequeLink ADO Data Source SyncTool will suggest to the end user that these data sources be imported as User data sources, but will allow them to be imported as User or System data sources.
 - *Suggest SequeLink System DSN*. When imported, the SequeLink ADO Data Source SyncTool will suggest to the end user that these data sources be imported as System data sources, but will allow them to be imported as User or System data sources.
 - *Force SequeLink User DSN*. When imported, the SequeLink ADO Data Source SyncTool will allow these data sources to be imported as User data sources only.
 - *Force SequeLink System DSN*. When imported, the SequeLink ADO Data Source SyncTool will allow these data sources to be imported as System data sources only.
- 10 Click **Finish** to quit.

Importing ADO Client Data Sources

The SequeLink administrator and end user use a slightly different implementation of the SequeLink ADO Data Source SyncTool to import ADO data source definitions.

To import ADO client data sources:

- 1 From the SequeLink program manager group, double-click the appropriate ADO SyncTool icon. The Welcome window appears.

- 2 Select the **Import** option; then, click **Next**.

NOTE: If using the SequeLink ADO Data Source SyncTool Administrator, select the **Import Data Sources** option, and click **Next**.

- 3 Select a data source file from the Filename list box, or click **Browse** to find a data source file not listed. The default extension for data source files is .OSF.

- 4 Verify that the appropriate actions will be performed on the data sources on your local machine; then, click **Next**. Depending on the import mode that was set when the data source file was exported, you may see the following symbols:

-  The data source will remain unchanged.
-  The data source will be added to your local machine.
-  The data source will be deleted from your local machine.
-  The data source will be updated to your local machine.

NOTE: Grayed-out data sources are data sources that are configured for a previous incompatible version of the SequeLink ADO Provider; these data sources will remain unchanged unless you update them in Interactive mode with a data source configured for the current version of the SequeLink ADO Provider.

- 5 Click **Finish** to quit.

11 Configuring the SequeLink Java Client

This chapter describes the tasks that you perform to configure and manage the SequeLink Java Client.

About JDBC Connections

You can open a JDBC connection to a SequeLink service by specifying a JDBC connection URL or configuring a JDBC client data source. This section explains how to connect to a SequeLink service using connection URLs. For information about configuring JDBC client data sources, refer to the *SequeLink Developer's Reference*.

Specifying SequeLink JDBC Driver Connection URLs

The connection URL format depends on whether you are using SSL encryption. For more information about SSL encryption, see [Chapter 13 “Configuring the SequeLink Proxy Server” on page 273](#).

If not using SSL encryption, the connection URL format is:

```
jdbc:sequelink://hostname:port[;key=value]...
```

If using SSL encryption, the connection URL format is:

```
jdbc:sequelink:ssl://hostname:port[;key=value]...
```

where:

hostname is the TCP/IP address or TCP/IP host name of the server to which you are connecting.

NOTE: Untrusted applets cannot open a socket to a machine other than the originating host. For more information about untrusted applets, see [“Using the SequeLink Proxy Server” on page 273.](#)

port is the TCP/IP port on which the SequeLink server is listening. A default installation of SequeLink Server uses the port 19996.

key=value specifies connection properties. For a list of connection properties and their valid values, see [“JDBC Connection Properties” on page 230.](#)

Connection URL Examples

The following examples show some typical SequeLink JDBC Driver connection URLs:

```
jdbc:sequelink://sequelinkhost:19996;
```

```
jdbc:sequelink://189.23.5.25:19996;user=john;  
password=whatever
```

```
jdbc:sequelink://189.23.5.132:19996;databaseName=stores7
```

```
jdbc:sequelink://189.23.5.68:19996;databaseName=pubs;  
HUser=john;HPassword=whatever
```

```
jdbc:sequelink://sequelinkhost:4006;  
databaseName=pubs;DBUser=john;DBPassword=whatever
```

```
jdbc:sequelink:ssl://mysecurehost:9500;  
cipherSuites=SSL_DH_anon_WITH_RC4_128_MD5  
  
jdbc:sequelink:ssl://mysecurehost:9502;  
cipherSuites=SSL_DHE_RSA_WITH_DES_CBC_SHA;  
certificateChecker=CheckAgainstCertificateFromJar
```

The preceding examples do not show the user and password connection properties. Typically, these properties are specified in the connection properties stored in the `java.util.Properties` object, which is supplied as a parameter to the `getConnection` method.

Specifying Connection Properties

You can specify connection properties using a connection URL, the JDBC Driver Manager, or JDBC data sources. This section describes how to specify connection properties using connection URLs or the JDBC Driver Manager. For information about specifying connection properties using JDBC data sources, refer to the *SequeLink Developer's Reference*.

To specify connection properties using a connection URL or the JDBC Driver Manager:

In order of precedence, you can specify connection properties using:

- `getConnection(url, user, password)`, where *user* and *password* are specified using the `getConnection` method defined in `java.sql.DriverManager`
- `java.util.properties` object
- Connection URL specified using the URL parameter of the `getConnection` method defined in `java.sql.DriverManager`
- Server data sources specified using the SequeLink Manager

For a list of the connection properties, see [“JDBC Connection Properties” on page 230](#).

JDBC Connection Properties

[Table 11-1](#) lists the JDBC connection properties supported by the SequeLink JDBC Driver, describes each property, and specifies the methods with which it can be specified.

Table 11-1. JDBC Properties

Property	Description
blockFetchForUpdate	<p>BlockFetchForUpdate={0 1}. Specifies a workaround connection attribute. When the isolation level is Read Committed and a SELECT FOR UPDATE statement is issued against some data stores, the SequeLink Java Client does not lock the expected row.</p> <p>When set to 0, the appropriate row is locked.</p> <p>When set to 1 (the initial default), the appropriate row is not locked.</p> <p>WARNING: Specifying 1 will degrade the performance for SELECT FOR UPDATE statements because rows will be fetched one at a time.</p> <p>This property can be specified using:</p> <ul style="list-style-type: none"> ■ JDBC data source ■ URL ■ java.util.properties ■ server data source

Table 11-1. JDBC Properties (cont.)

Property	Description
certificateChecker	<p>The fully qualified class name of a user-defined server certificate checker class. When the SequeLink Client and SequeLink Server have agreed on an SSL cipher suite that requires a server certificate, this class is used to verify the server certificate on behalf of the client. The class must be an implementation of the <code>com.merant.sequelink.cert.CertificateCheckerInterface</code> interface.</p> <p>This property can be specified using:</p> <ul style="list-style-type: none"> ■ JDBC data source ■ URL ■ <code>java.util.properties</code> <p>For more information about certificate checker classes, see “Verifying the SequeLink Proxy Server Certificate” on page 293.</p>
cipherSuites	<p>The Secure Socket Layer (SSL) cipher suites with which the SequeLink Java Client can use to connect. This property is required when <code>networkProtocol=ssl</code>.</p> <p>For a list of supported cipher suites, see “SSL Cipher Suites” on page 284.</p> <p>This property can be specified using:</p> <ul style="list-style-type: none"> ■ JDBC data source ■ URL ■ <code>java.util.properties</code>
databaseName	<p>The name of the data store to which you want to connect.</p> <p>This property can be specified using:</p> <ul style="list-style-type: none"> ■ JDBC data source ■ URL ■ <code>java.util.properties</code> ■ server data source

Table 11-1. JDBC Properties (cont.)

Property	Description
DBUser	<p>The data store user name, which may be required depending on the server configuration.</p> <p>This property can be specified using:</p> <ul style="list-style-type: none"> ■ JDBC data source ■ URL ■ java.util.properties
DBPassword	<p>The data store password, which may be required depending on the server configuration.</p> <p>This property can be specified using:</p> <ul style="list-style-type: none"> ■ JDBC data source ■ URL ■ java.util.properties
HUser	<p>The host user name, which may be required depending on the server configuration.</p> <p>This property can be specified using:</p> <ul style="list-style-type: none"> ■ JDBC data source ■ URL ■ java.util.properties
HPassword	<p>The host password, which may be required depending on the server configuration.</p> <p>This property can be specified using:</p> <ul style="list-style-type: none"> ■ JDBC data source ■ URL ■ java.util.properties
networkProtocol	<p>networkProtocol={socket ssl}. Specifies the protocol to be used.</p> <p>When set to socket (the initial default), SSL encryption is not used.</p> <p>When set to SSL, SSL encryption is used.</p> <p>This property can be specified using:</p> <ul style="list-style-type: none"> ■ JDBC data source ■ URL ■ java.util.properties

Table 11-1. JDBC Properties (cont.)

Property	Description
newPassword	<p>The new host password to be used. If specified and applicable to the connection, the SequeLink password change mechanism is invoked. When the password has been changed successfully, the following warning is returned:</p> <pre>[MERANT] [SequeLink JDBC driver] [SequeLink Server] The user password was changed successfully</pre> <p>This property can be specified using:</p> <ul style="list-style-type: none"> ■ JDBC data source ■ URL ■ java.util.properties <p>For more information about the SequeLink password change mechanism, see Chapter 12 “Configuring SequeLink Security” on page 241.</p>
password	<p>The host or data store password, which may be required depending on the server configuration.</p> <p>This property can be specified using:</p> <ul style="list-style-type: none"> ■ getConnection ■ JDBC data source ■ URL ■ java.util.properties
portNumber	<p>The TCP/IP port on which the SequeLink service is listening.</p> <p>This property can be specified using:</p> <ul style="list-style-type: none"> ■ JDBC data source ■ URL
serverName	<p>The TCP/IP address of the SequeLink server in dotted format or host name format.</p> <p>This property can be specified using:</p> <ul style="list-style-type: none"> ■ JDBC data source ■ URL

Table 11-1. JDBC Properties (cont.)

Property	Description
SLKStaticCursorLongColBuffLen	<p>The amount of data (in KB) that is buffered for SQL_LONGVARCHAR and SQL_LONGVARBINARY columns with an insensitive result set.</p> <p>The default is 4.</p> <p>This property can be specified using:</p> <ul style="list-style-type: none"> ■ JDBC data source ■ URL ■ java.util.properties ■ server data source
serverDataSource	<p>A property that specifies a string to identify the server data source to be used for the connection. If unspecified, the configuration of the default server data source will be used for the connection.</p> <p>This property can be specified using:</p> <ul style="list-style-type: none"> ■ JDBC data source ■ URL ■ java.util.properties
user	<p>The host or data store user name, which may be required depending on the server configuration.</p> <p>This property can be specified using:</p> <ul style="list-style-type: none"> ■ getConnection ■ JDBC data source ■ URL ■ java.util.properties

Testing SequeLink JDBC Connections

This section describes how to test your connection with JDBCTest. For more information about using JDBCTest, refer to the *SequeLink Developer's Reference*.

To connect with the SequeLink Java Client using JDBCTest:

- 1 Start JDBCTest as a Java application or applet.



- *As a Java application on Windows:* Run the jdbctest.bat file located in the jdbctest directory.



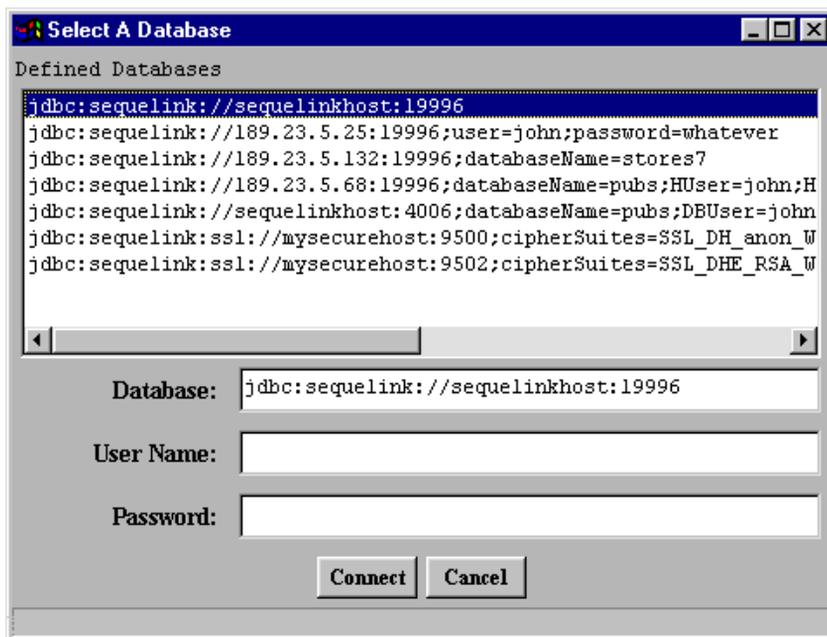
- *As a Java application on UNIX:* Run the jdbctest.sh shell script located in the jdbctest directory.

- *As an applet:* Start your applet viewer or Web browser and open the HTML file jdbctest.html located in the jdbctest directory.

- 2 From the JDBCTest Welcome window, click the **Press Here To Continue** button. The JDBCTest window appears.
- 3 Select **Driver / Register Driver**. JDBCTest prompts you for the JDBC driver you want to load.
- 4 In the Please Supply a Driver URL field, make sure that the following driver is specified; then, click **OK**.

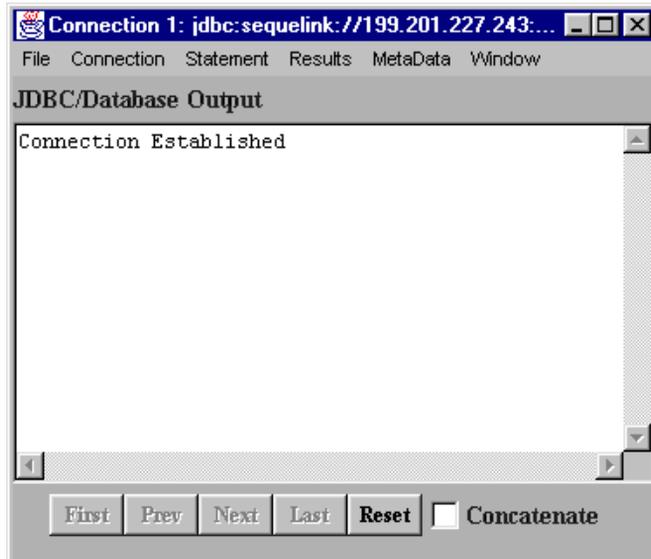
```
com.merant.sequelink.jdbc.SequeLinkDriver
```

- 5 Select **Connection / Connect To DB**. The Select A Database window appears with a list of default SequeLink JDBC Driver connection URLs.



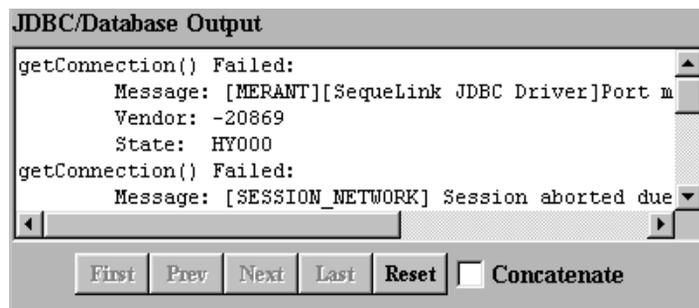
- 6 Select one of the default SequeLink JDBC Driver connection URLs. In the Database field, modify the default values of the connection URL appropriately for your environment.
- 7 In the User Name and Password fields, type the required user and password connection properties; then, click the **Connect** button. For information about JDBC connection properties, see ["JDBC Connection Properties"](#) on page 230.

- 8 If the connection was successful, the Connection window shows the Connection Established message in the JDBC/Database Output scroll box.



If the connection was successful, you can start using your JDBC applications with SequeLink.

If the connection was unsuccessful, you are returned to the JDBCTest window. The `getConnection()` Failed: message appears in the JDBC/Database Output scroll box. If your connection failed, refer to the *SequeLink Troubleshooting Guide and Reference*.



Part 3: Using SequeLink Security

This part contains the following chapters:

- [Chapter 12 “Configuring SequeLink Security” on page 241](#) provides an overview of SequeLink security options and describes how to configure SequeLink security for Windows, UNIX, and OS/390 platforms.
- [Chapter 13 “Configuring the SequeLink Proxy Server” on page 273](#) describes how to configure SequeLink security for Java environments.

12 Configuring SequeLink Security

This chapter offers an overview of the security options provided by SequeLink and describes how to configure SequeLink security for Windows, UNIX, and OS/390 platforms. For information about configuring SequeLink Proxy Server, see [Chapter 13 “Configuring the SequeLink Proxy Server”](#) on page 273.

About SequeLink Security

SequeLink security supports security mechanisms for the following purposes:

- Verification of a user by the SequeLink Server. The **Authentication** security mechanism allows the SequeLink Server to verify the identity of the user.
- Types of requests that are accepted by the server. The **Authorization** security mechanism controls whether the user can send data access requests and administrative (SequeLink Manager) requests, and whether the requests can be accepted by the server.
- Connection to a data store using the following security mechanisms:
 - **Data Store Logon** controls whether a user who is connected to the SequeLink Server can connect to the data store.

- **Application IDs** control whether a client application can connect to the data store. This mechanism adds a layer of security on top of Data Store Logon.
- Types of SQL statements accepted by the data store. The **ReadOnly** security mechanism controls whether the data store connection is read-only.
- The privacy of the data being transmitted. The **data privacy** security mechanism ensures that data transmitted between the client and server is kept private using data scrambling methods and encryption through Secure Socket Layer (SSL) (SSL is supported for Java environments only).

Authentication

Authentication allows the SequeLink Server to verify the identity of the SequeLink Client when the client connects to the SequeLink Server. If authentication fails, the SequeLink Client will disconnect from the server. Authentication must be set separately for users (people who send data access requests) and administrators (people who send SequeLink Manager requests).

Even though a user may be able to connect to the SequeLink Server, this does not mean that the user automatically has access to the database that the SequeLink Server services.

Depending on the combination of client and server platforms involved in the connection, SequeLink supports the following authentication mechanisms:

- **Anonymous.** The SequeLink Server accepts connections from any SequeLink Client without verifying the client's identity. This is the default on Windows and UNIX for users (ServiceAuthMethods=anonymous).



- **Integrated NT.** This option is supported for connections between SequeLink ODBC Clients and SequeLink ADO Clients on Windows and SequeLink Server for Windows NT servers

only. The SequeLink Server verifies the identity of the SequeLink Client using the client's Windows network logon credentials instead of a Windows user and password.

- **Operating system user ID and password.** The SequeLink Server verifies the identity of the SequeLink Client using a user ID and password that must be valid for the platform on which the SequeLink Server is running. If verified, the server accepts the user ID as the identity of the client and permits the connection. This is the default on Windows and UNIX for administrators (ServiceAdminAuthMethods=OSlogon(UID,PWD)).

Authorization

After the SequeLink Server has authenticated the client, SequeLink verifies that the client is authorized to perform data access activities or SequeLink Manager activities. SequeLink supports authorization for data access requests and for SequeLink Manager requests. You configure the authorization for the two types of requests separately. Authorization options depend on your SequeLink Server platform.

For instructions on configuring authorization:

- On Windows and UNIX, see ["Configuring SequeLink Security on Windows and UNIX"](#) on page 247.
- On OS/390, see ["Configuring SequeLink Security for OS/390"](#) on page 257.

Data Store Logon

Once a connection is established, authentication is complete, and the type of requests the server will accept has been established, a connection from the SequeLink Server to the data store can be established using either of the following methods:

- Specifying data store logon information (a valid DBMS user ID and password). This is the default for Windows and UNIX (`DataSourceLogonMethod=DBMSLogon(UID,PWD)`).
- Allowing the database to inherit the logon user ID that was established during the authentication process. This method must be used for OS/390, but can be used for Windows and UNIX also (`DataSourceLogonMethod=OSIntegrated`).

Application IDs

Application IDs are alphanumeric strings passed by a SequeLink Client that identify the client application to a SequeLink service that has been configured to accept connections only from specific application IDs.

Application IDs add another layer of security for the connection to the data store beyond that provided by the Data Store Logon security mechanism. Data Store Logon allows all users of client applications to access the data store if the users meet the qualifications set by Data Store Logon. Using application IDs, you can restrict connections to the data store to only those client applications that identify themselves to the SequeLink Server through an application ID.

For more information about using application IDs, see [“Using Application IDs to Restrict User Access” on page 266](#).

ReadOnly

SequeLink allows you to configure the types of SQL statements the data store connection will accept:

- Select statements only, which makes the connection read-only
- Select statements and Stored Procedures
- All SQL statements

The service attribute that controls this functionality is `DataSourceReadOnly`.

Data Privacy

To ensure privacy of data, SequeLink provides data scrambling (all SequeLink environments) and "real" encryption through using SSL (SequeLink Java environments only).

Data Scrambling

Data scrambling ensures that no cleartext messages are transmitted between the client and server over the network. SequeLink provides the following implementations of data scrambling:

- **Fixed-key DES** operates using a 56-bit key.
- **Fixed-key 3DES** operates using a 168-bit key.
- **Byte swapping** means that bytes of data are randomly swapped to scramble data. Different encoded mappings are used for different sessions.

Data scrambling does not offer the same level of security as SSL and its use may degrade performance. Data scrambling is not enabled by default.

NOTE: Even if you choose not to use a data scrambling method, user IDs and passwords are *never* sent as cleartext.

For more information about configuring data scrambling, see [“Configuring Data Privacy” on page 252](#).

SSL (Java Environments Only)

Secure Socket Layer (SSL) encryption provides data encryption, server authentication, and message integrity for TCP/IP connections using the following methods:

- **Asymmetric cryptographic algorithms** protect the exchange of symmetric encryption keys. SequeLink supports the following asymmetric cryptographic algorithm classes:
 - **Anonymous.** The exchange of the symmetric key for the data transfer is protected by an asymmetric key agreement protocol, but the client does not verify the identity of the server. The anonymous mechanism provides protection against passive eavesdropping on communication lines, preventing someone who is monitoring network traffic from deciphering the exchanged data. It does not provide protection from “man-in-the-middle” security infiltrations, in which intruders position themselves between the client and the server, pretending to the client to be the server and vice versa, and allowing the intruders to intercept, inspect, and possibly alter the data exchanged between the client and the server.
 - **Server authentication.** When communication begins, the server identifies itself to the client, using a digital certificate as proof of identity. The client verifies this certificate to ensure that the server is really the party with whom it wants to communicate.

- **Symmetric cryptographic algorithms** encrypt and decrypt the actual data.
- **Message digest algorithms** ensure message integrity.

The combination of all these algorithms is called a *cipher suite*. The SSL standard defines the cipher suites that can be specified. The actual availability of a cipher suite is determined by the underlying implementation. For more information about configuring SSL and specifying cipher suites, see [Chapter 13 “Configuring the SequeLink Proxy Server” on page 273](#).

NOTE: SequeLink supports Netscape’s Transport Layer Security (TLS) 1.0 through its SSL implementation.

Configuring SequeLink Security on Windows and UNIX

This section describes how to configure SequeLink authentication, authorization, and data store logon for Windows and UNIX.

Configuring Authentication for a SequeLink Data Access Service

Set the ServiceAuthMethods service attribute to one or more of the following values:

- ServiceAuthMethods=anonymous
- ServiceAuthMethods=integrated_nt
- ServiceAuthMethods=OSLogon(HUID,HPWD)
- ServiceAuthMethods=OSLogon(UID,PWD)

- `ServiceAuthMethods=OSLogon(UID,PWD,NPWD)`
(Windows NT only)
- `ServiceAuthMethods=OSLogon(HUID,HPWD,NPWD)`
(Windows NT only)

NOTE: The NPWD parameter of OSLogon allows you to change the password.



For SequeLink services on Windows NT, you can configure multiple authentication mechanisms. For example, if you configured `ServiceAuthMethods=integrated_nt` and `ServiceAuthMethods=OSLogon(UID,PWD)`, the SequeLink Server will use the Integrated NT authentication mechanism and will not require a SequeLink ODBC or SequeLink ADO Client connecting from a Windows workstation to provide user ID and password information. SequeLink Clients on UNIX or a JDBC application still must provide a valid Windows NT user ID and password.

Configuring Authentication for a SequeLink Agent Service

To configure authentication for a SequeLink agent service, set the `ServiceAdminAuthMethods` service attribute to one or more of the following values:

- `ServiceAdminAuthMethods=anonymous`
- `ServiceAdminAuthMethods=integrated_nt`
- `ServiceAdminAuthMethods=OSLogon(UID,PWD)`



For SequeLink services on Windows NT, you can configure multiple authentication mechanisms. For example, if you configured `ServiceAdminAuthMethods=integrated_nt` and `ServiceAdminAuthMethods=OSLogon(UID,PWD)`, the SequeLink Server will use the Integrated NT authentication mechanism and will not require a SequeLink Manager running on a Windows workstation to provide user ID and password information.

SequeLink Clients on UNIX still must provide a valid Windows NT user ID and password.

Configuring Authorization for a SequeLink Data Access Service

To configure user authorization for a SequeLink data access service, set the `ServiceUser` attribute, or, if you want to configure user authorization for user groups defined on Windows NT or UNIX, set the `ServiceUserGroup` attribute.

Configuring ServiceUser

To configure user authorization, set the `ServiceUser` attribute:

- `ServiceUser=user_ID`, where `user_ID` is the user ID of each user who is allowed to access data using this service. To configure authorization for multiple users, you must set this attribute multiple times, one instance for each user. For example:

```
ServiceUser=RSMITH
ServiceUser=DJONES
ServiceUser=TCONRAD
```



NOTE: On Windows NT servers, you must prefix the user ID with the Windows NT server name or the Windows NT domain name, for example, SALES\DJONES. When connecting, the user must also prefix the user ID with the Windows NT server name, if connecting to a local server, or the Windows NT domain name.

- `ServiceUser=authenticated`. Any user who can provide a valid host user ID and password or who uses the Integrated NT authentication process will be allowed to send data access requests to the data access service.

- `ServiceUser=everyone`. All connections will receive the user authorization level, regardless of how they are authenticated. If `ServiceAuthMethods=anonymous`, `ServiceUser=everyone` **must** be specified.

Configuring ServiceUserGroup

To configure user authorization for user groups defined on Windows NT or UNIX, set the `ServiceUserGroup` attribute. Specify `ServiceUserGroup=user_group`, where `user_group` is a valid user group defined on Windows NT or UNIX. To configure user authorization for multiple user groups, you must set this attribute multiple times, one instance for each user. For example:

```
ServiceUserGroup=SLUSERG1
ServiceUserGroup=SLUSERG2
ServiceUserGroup=SLUSERG3
```



NOTE: On Windows NT servers, you must prefix the user group ID with the Windows NT server name or the Windows NT domain name where the user group is defined, for example, `SALES\SLUSERG1`. When connecting, the user must also prefix the administrator ID with the Windows NT server name, if connecting to a local server, or the Windows NT domain name.

Configuring Authorization for a SequeLink Agent Service

To configure administration authorization, set the `ServiceAdministrator` service attribute, or, if you want to configure authorization for user groups defined on Windows NT or UNIX, set the `ServiceAdministratorGroup` service attribute.



NOTE: On Windows NT, each user who is allowed to make SequeLink Manager requests must have NT administrator rights.

Configuring ServiceAdministrator

To configure administration authorization, set the ServiceAdministrator attribute:

- ServiceAdministrator=*user_ID*, where *user_ID* is the user ID of each user who is allowed to make SequeLink Manager requests. To configure administration authorization for multiple users, you must set this attribute multiple times, one instance for each user. For example:

```
ServiceAdministrator=RSMITH
ServiceAdministrator=DJONES
ServiceAdministrator=TCONRAD
```



NOTE: On Windows NT servers, you must prefix the user ID with the Windows NT server name or the Windows NT domain name, for example, SALES\DJONES. When connecting, the user must also prefix the user ID with the Windows NT server name, if connecting to a local server, or the Windows NT domain name.

- ServiceAdministrator=authenticated. Any user who can provide a valid host user ID and password or who uses the Integrated NT authentication process will receive the same administration authorization.
- ServiceAdministrator=everyone. All connections will receive the same administration authorization, regardless of how they are authenticated. If ServiceAdminAuthMethods=anonymous, you must specify ServiceAdministrator=everyone.

Configuring ServiceAdministratorGroup

To configure authorization for user groups defined on Windows NT and UNIX, set the ServiceAdministratorGroup attribute. Specify ServiceAdministratorGroup=*user_group*, where *user_group* is a valid user group defined on Windows NT

or UNIX. To configure administration authorization for multiple user groups, you must set this attribute multiple times, one instance for each user. For example:

```
ServiceAdministratorGroup=SLUSERG1
ServiceAdministratorGroup=SLUSERG2
ServiceAdministratorGroup=SLUSERG3
```



NOTE: On Windows NT servers, you must prefix the user group ID with the Windows NT server name or the Windows NT domain name where the group is defined, for example, SALES\SLUSERG1. When connecting, the user must also prefix the user group with the Windows NT server name, if connecting to a local server, or the Windows NT domain name.

Configuring Data Privacy

To ensure privacy of data, SequeLink provides data scrambling (all SequeLink environments) and "real" encryption through the use of SSL (SequeLink Java environments only).

Data scrambling ensures that no cleartext messages are transmitted between the client and server over the network. SequeLink provides the following implementations of data scrambling:

- **Fixed-key DES** operates using a 56-bit key.
- **Fixed-key 3DES** operates using a 168-bit key.
- **Byte swapping** means that bytes of data are randomly swapped to scramble data. Different encoded mappings are used for different sessions.

Data scrambling does not offer the same level of security as SSL and its use may degrade performance. Data scrambling is not enabled by default.

NOTE: Even if you choose not to use a data scrambling method, user IDs and passwords are *never* sent as cleartext.

To configure SequeLink to use DES, 3DES, or byteswap, you must set the `ServiceEncryptionAlgorithm` service attribute, for example, `ServiceEncryptionAlgorithm=DES`. Data scrambling is not enabled by default, which means that if you do not configure data scrambling, cleartext messages are transmitted between the client and server over the network.

SSL is provided by the SequeLink Proxy Server component. For information about configuring SSL, see [Chapter 13 “Configuring the SequeLink Proxy Server”](#) on page 273.

Configuring Data Store Logon

A client application establishing a connection to the database must provide a valid DBMS user ID and password when `DataSourceLogonMethod=DBMSLogon(UID,PWD)` or `DataSourceLogonMethod=DBMSLogon(DBUID,DBPWD)`.

Depending on how the SequeLink service is configured, the SequeLink Server may require the SequeLink Client to provide two user IDs and passwords. SequeLink Clients usually provide user ID and password information using the UID and PWD attributes in a connection string (ODBC and ADO) or a connection URL (JDBC).

To avoid possible conflict with a standard keyword pair (UID,PWD) with two sets of values, make sure that you set non-conflicting values for the `ServiceAuthMethods` and `DataSourceLogonMethod` attributes. For example, when `ServiceAuthMethods=OSLogon(UID,PWD)` and `DataSourceLogonMethod=DBMSLogon(DBUID,DBPWD)`, the SequeLink Client must provide the operating system user and password using the keywords UID and PWD and the database user and password must be specified using the DBUID and DBPWD keywords.

To allow the DBMS to inherit the operating system (or network) user ID and password for data store authorization, specify `DataSourceLogonMethod=OSIntegrated`.

NOTE: Do not use this method when `ServiceAuthMethods=anonymous`.

Configuring Single Sign-On Security

The combination of security features provided by SequeLink and the security provisions offered by the DBMS and the Windows operating system allows you to configure a single sign-on environment for ODBC and ADO applications. The user logs on to the Windows network and can connect to the DBMS using the Windows identity (if allowed by the DBMS security configuration).

To configure single sign-on security for ODBC:

- 1 Configure your DBMS security:
 - For Microsoft SQL Server, configure the DBMS security for mixed or integrated security.
 - For Oracle, configure the DBMS security to allow external authentication (formerly OPS\$ functionality).

For instructions on how to configure your DBMS security, refer to your data store documentation.

- 2 Grant the required database access rights to Windows users using the appropriate data store provided by your DBMS. For instructions on how to grant database access rights, refer to your DBMS documentation.
- 3 Specify `ServiceAuthMethods=integrated_nt`.
- 4 Specify `DataSourceLogonMethod=OSIntegrated`.
- 5 Restart the SequeLink Server.

- 6 If SequeLink Clients on UNIX or SequeLink Java Clients will be connecting to this service, add another ServiceAuthMethods attribute, and specify
 ServiceAuthMethods=OSLogon (HUID, HPWD) or
 ServiceAuthMethods=OSLogon (UID, PWD) . These SequeLink Clients must provide a valid Windows NT user ID and password.

SequeLink Manager Security Attribute Defaults for Windows and UNIX

This section lists the installation defaults for SequeLink's security attributes for Windows and UNIX and describes the effect each combination of settings has on security.

Defaults for a SequeLink Agent Service

```
ServiceAdminAuthMethods=OSlogon (UID, PWD)
ServiceAdministrator=SequeLink_administrator
```

The combination of defaults for these attributes means that only the person who logs on using the user ID that was entered when the SequeLink Server software was installed is allowed to manage the SequeLink environment. The SequeLink Server installer prompts for a user ID for the SequeLink administrator when you install the SequeLink Server. On Windows NT, the SequeLink administrator must have NT administrator rights.

```
ServiceEncryptionAlgorithm=none
```

The default for this attribute means that cleartext messages are transmitted between the client and server. Note that user IDs and passwords are *never* sent as cleartext.

Defaults for a Data Access Service

```
ServiceAuthMethods=anonymous  
ServiceUser=everyone  
DataSourceLogonMethod=DBMSLogon (UID, PWD)  
DataSourceReadOnly=No
```

The combination of defaults for these attributes means that anyone who can provide a valid DBMS user name and password will be allowed to access the database using this service. The database connection accepts all types of SQL statements. Once connected to the DBMS, the database security system will guarantee that the user can only perform actions that are allowed by the database administrator.

```
ServiceEncryptionAlgorithm=none
```

The default for this attribute means that cleartext messages are transmitted between the client and server. Note that user IDs and passwords are never sent as cleartext.

Configuring SequeLink Security for OS/390

This section describes how to configure SequeLink authentication, authorization, and data store logon for OS/390. The security of the SequeLink Server for OS/390 is integrated with the OS/390 security system using the SAF interface.

Configuring Security for a SequeLink Data Access Service for OS/390

To configure authentication without additional authorization for a SequeLink data access service, set the `MVSServiceSecurity` attribute to either one of the following options:

- `MVSServiceSecurity=SAFBASIC`. The SequeLink Server validates the SequeLink Client's identity using the client's user ID and password. This is the default.
- `MVSServiceSecurity=SAFNONE`. The SequeLink Server accepts connections from any SequeLink Client without verifying the client's identity. When `ServiceAuthMethods=anonymous`, you must specify `MVSServiceSecurity=SAFNONE`.

To configure authentication and resource based authorization for OS/390, set `MVSServiceSecurity=SAFRESOURCE`. The SequeLink Server validates the SequeLink Client's identity using the client's user ID and password and the client's authority to access the service. If this option is used, you may specify a security resource and a security class. The SequeLink service name must be defined in the security system's general resource class profile. Also, any user that requires access to this SequeLink service must be granted READ access to the specified resource defined in this class.

Configuring Security for a SequeLink Agent Service for OS/390

To configure authentication without additional authorization for a SequeLink Agent service, set the `MVSServiceAdminSecurity` attribute to one of the following options:

- `MVSServiceAdminSecurity=SAFBASIC`. The SequeLink Server validates the SequeLink Client's identity using the client's user ID and password. This is the default.
- `MVSServiceAdminSecurity=SAFNONE`. The SequeLink Server accepts connections from any SequeLink Manager without verifying the identity. When `ServiceAuthAdminMethods=anonymous`, you must specify `MVSServiceAdminSecurity=SAFNONE`.

To configure authentication and resource based authorization for OS/390, set `MVSServiceAdminSecurity=SAFRESOURCE`. The SequeLink Server validates the SequeLink Client's identity using the client's user ID and password and the client's authority to access the service. If this option is used, you may specify a security resource and a security class. The SequeLink service name must be defined in the security system's general resource class profile. Also, any user that requires access to this SequeLink service must be granted `READ` access to the specified resource defined in this class.

Configuring Authentication

On OS/390, SequeLink supports the anonymous and host user ID and password authentication mechanisms. The client application must provide a valid user ID and password for the platform on which the SequeLink Server is running. The server verifies the user ID and password. If verified, the server accepts the user ID as the identity of the client. When a password change is wanted or

required (for example, when a password expires), the client application must also provide a new password.

Configuring Authentication for a SequeLink Data Access Service for OS/390

To configure authentication for a SequeLink data access service, set the `ServiceAuthMethods` attribute to one of the following values:

```
ServiceAuthMethods=anonymous
```

or

```
ServiceAuthMethods=OSLogon (UID, PWD, NPWD)
```

Configuring Authentication for a SequeLink Agent Service for OS/390

To configure authentication for a SequeLink Agent service, set the `ServiceAdminAuthMethods` attribute to one of the following values:

```
ServiceAdminAuthMethods=anonymous
```

or

```
ServiceAdminAuthMethods=OSLogon (UID, PWD)
```

Configuring Resource-Based Authorization

To configure authorization for SequeLink, specify a security class and a security resource in this class.

How you configure authorization depends on whether you are configuring it for users of a SequeLink data access service or a SequeLink agent service.

Configuring Resource-Based Authorization for a SequeLink Data Access Service

To configure resource based authorization for a SequeLink data access service, set the following attributes to the following values:

- `MVSServiceSecurityResource=sec_resource_name`, where `sec_resource_name` is the name of the security resource where access is defined for your users. The default value is the name of the service name of the data access service.
- `MVSServiceSecurityClass=sec_class_name`, where `sec_class_name` is the name of the security class where the `MVSServiceSecurityResource` is defined. The default value is FACILITY.

Configuring Resource-Based Authorization for a SequeLink Agent Service

To configure resource based authorization for a SequeLink Agent service, set the following attributes to the following values:

- `MVSServiceAdminSecurityResource=sec_resource_name`, where `sec_resource_name` is the name of the security resource where access is defined for your users.
- `MVSServiceAdminSecurityClass=sec_class_name`, where `sec_class_name` is the name of the security class where the `MVSServiceAdminSecurityResource` is defined. The default value is FACILITY.

Configuring Data Store Logon

To allow the DBMS to inherit the operating system (or network) user identification to use for database authorization, set the `DataSourceLogonMethod` attribute to the following value:

```
DataSourceLogonMethod=OSIntegrated
```

When `ServiceAuthMethods=anonymous`, you must create a UID map that maps users to a default database user. For more information about UID maps, see [“Using UID Mapping” on page 262](#).

SequeLink Manager Security Attribute Defaults for OS/390

This section lists the installation defaults for SequeLink’s security attributes for OS/390 and describes the effect each combination of settings has on security.

Defaults for a SequeLink Agent Service

```
MVSServiceAdminSecurity=SAFBASIC
ServiceAdminAuthMethods=OSLogon (UID, PWD)
```

The combination of defaults for these attributes means that everyone who can provide a valid host user name and password will be allowed to access the SequeLink Agent service.

Defaults for a Data Access Service

```
MVSServiceSecurity=SAFBASIC
ServiceAuthMethods=OSLogon (UID, PWD)
DataSourceLogonMethod=OSIntegrated
DataSourceReadOnly=No
```

The combination of defaults for these attributes means that everyone who can provide a valid host user name and password will be allowed to access the database using this service. The database connection accepts all types of SQL statements. Once connected to the database, the database security system will guarantee that the user can only perform actions that are allowed by the database administrator.

```
ServiceEncryptionAlgorithm=none
```

The default for this attribute means that cleartext messages are transmitted between the client and server. Note that user IDs and passwords are never sent as cleartext.

Using UID Mapping

UID mapping is the mapping of user IDs to alternate user IDs using a UID map. You can use UID mapping to prevent users from updating DB2 tables using commonly available tools, such as QMF or SPUFI, while preserving their ability to update DB2 tables using SequeLink. For example, suppose a user, SMITH, has privileges defined in a UID map as shown:

User ID	DB2 Table Privilege	SequeLink Plan Privilege	Application
SMITH	UPDATE	EXECUTE	SequeLink service
SMITH	UPDATE	EXECUTE	SPUFI

In this example, SMITH can update DB2 tables using SPUFI and the SequeLink service.

To prevent SMITH from updating DB2 tables using SPUFI, you can map the logon ID to an alternate user ID—for example, SMITH=SMITHB. Once the logon ID SMITH has been mapped to

the alternate user ID SMITHB, you can specify the DB2 table privileges as shown:

User ID	DB2 Table Privilege	SequeLink Plan Privilege	Application
SMITHB	UPDATE	EXECUTE	SequeLink service
SMITH	SELECT	EXECUTE	SPUFI

The UPDATE privilege set for SMITHB allows SMITH to update DB2 tables using a SequeLink service. The SELECT privilege set for SMITH allows read-only access to the DB2 tables using SPUFI.

NOTE: Alternate UIDs are used internally for UID mapping only. If a SequeLink Client attempts to log on with an alternate UID, the logon will be rejected. You can also map an RACF group to a single alternate user, simplifying the administrative task of managing multiple users.

When a UID map is specified for a service, the SequeLink Client's user ID is mapped to an alternate UID as specified in the UID map. If a UID map has been specified for the SequeLink service, that service will use the alternate UID specified in the UID map as the DB2 authorization ID when logging on to DB2. If an alternate UID cannot be found in the UID map, the SequeLink Client's logon ID will be used as the DB2 authorization ID when MVSUIDDefaultAccess=PERMIT. All status displays will continue to show the SequeLink Client's logon ID.

To configure UID mapping for a SequeLink service, set the following attributes:

MVSServiceUIDMap	Specify the name of the UID map you want the service to use.
MVSUIDDefaultAccess	Controls UID mapping behavior for a service. Valid values include: PERMIT=If user ID mapping is set for the service and the user ID cannot be found in the UID map, the connection is accepted. DENY=If user ID mapping is set for the service and the user ID cannot be found in the UID map, the connection is refused.

To configure UID map entries, set the following attribute:

MVSUID	Specify an entry in the UID map using the format <i>user=mapped_user</i> or <i>*=mapped_user</i> , where: <ul style="list-style-type: none">■ <i>user</i> is a valid user or user group for the OS/390 security system.■ <i>*</i> is a wildcard for any user.■ <i>mapped_user</i> is a valid DB2 authorization ID. <i>*=mapped_user</i> is required when the SequeLink service attributes <code>ServiceAuthMethods=Anonymous</code> and <code>MVSServiceSecurity=SAFNONE</code> .
--------	---

For example, suppose you wanted to configure UID maps for the following services and users as shown:

SequeLink Service	UID Service Settings	UID Map Definitions
SLDB2A	MVSServiceUIDMap=UIDMap1 MVSUIDDefaultAccess=DENY	SMITH=SMITHA ERICK=ERICKA
SLDB2B	MVSServiceUIDMap=UIDMap2 MVSUIDDefaultAccess=DENY	SMITH=APPDB2B EDWARDS=APPDB2B
SLDB2C	MVSServiceUIDMap=UIDMap3 MVSUIDDefaultAccess=PERMIT	SMITH=SMITHC ERICK=ERICKC
SLDB2D	A UID map was not specified for this SequeLink service.	
SLDB2E	MVSServiceUIDMap=UIDMap5 MVSUIDDefaultAccess=DENY	SMITH=APPDB2B *=APPDB2Z

Using this example, the following scenarios could occur:

User ID	Service	Map ID	Action	Explanation of Action
ALBERT	SLDB2A	n/a	Denied	Connection denied because ALBERT was not in UIDMAP1
ALBERT	SLDB2C	n/a	Permit	Connection permitted to SLDB2C as ALBERT
SMITH	SLDB2B	APPDB2B	Connect	Connection to SLDB2B as APPDB2B
EDWARDS	SLDB2B	APPDB2B	Connect	Connection to SLDB2B as APPDB2B
ERICK	SLDB2B	n/a	Denied	Connection denied because ERICK was not in UIDMAP2
ERICK	SLDB2C	ERICKC	Connect	Connection to SLDB2C as ERICKC

User ID	Service	Map ID	Action	Explanation of Action
SMITH	SLDB2D	n/a	Connect	No UID mapping for SLDB2D
Anonymous	SLDB2B	n/a	Denied	Connection denied because no *=mapped_user entry in UID map
Anonymous	SLDB2E	APPDDB2Z	Connect	Connection to SLDB2E as APPDDB2Z

Using Application IDs to Restrict User Access

Application IDs are alphanumeric strings passed by a SequeLink Client that identify the client application to a SequeLink service that has been configured to accept connections only from specific application IDs.

Application IDs add another layer of security for the connection to the data store beyond that provided by the Data Store Logon security mechanism. Data Store Logon allows all users of client applications to access the data store if the users meet the qualifications set by Data Store Logon. Using application IDs, you can restrict connections to the data store to only those client applications that identify themselves to the SequeLink Server through an application ID.

For more information about using application IDs, see [“Using Application IDs to Restrict User Access” on page 266](#).



On Windows platforms, application IDs can be specified explicitly by the client application or they can be automatically generated by the SequeLink ODBC Client or the SequeLink ADO Client. The advantage of using application IDs generated by the SequeLink ODBC Client or SequeLink ADO Client is the application itself does not need to contain the application ID; however, you must specify in the client application that you want to turn on the automatic generation of application IDs. The application ID is

generated using the sha-1 hashing algorithm, resulting in a 160-bit hash value.

Specifying Application IDs Using ODBC Client Applications

This section describes how to specify application IDs explicitly using ODBC client applications and by turning on the automatic generation of application IDs.

Specifying Application IDs Explicitly

ODBC client applications can identify themselves explicitly to the SequeLink service in any of the following ways:

- **Specifying the application ID in the ODBC connection string that is passed to `SQLDriverConnect`.** For example:

```
....;APPID=MyAppID;
```

or

```
....;ApplicationID=MyAppID;
```

where *MyAppID* is the application ID.

- **Specifying the application ID using `SQLSetConnectOption`.** Immediately after each call to `SQLConnect` or `SQLDriverConnect` connecting to the SequeLink ODBC Client, call `SQLSetConnectOption` as shown:

```
short res_code;
res_code=SQLSetConnectOption(hdbc, 1053, "myAppId")
```

where *myAppId* is the application ID.

The `SQLSetConnectOption` is defined in `sql.h`. If an incorrect application ID is specified, the `SQLSetConnectOption` fails, and all subsequent SQL statements will fail.

- **Specifying the application ID using SQLSetConnectAttr.** Immediately after each call to SQLConnect or SQLDriverConnect connecting to the SequeLink ODBC Client, call SQLSetConnectAttr as shown:

```
SQLSetConnectAttr(hdbc, 1053, "myAppId", SQL_NTS)
```

where *myAppId* is the application ID.

The SQLSetConnectAttr is defined in sql.h. If an incorrect application ID is specified, the SQLSetConnectAttr fails and all subsequent SQL statements fail.

Generating Application IDs Automatically

ODBC client applications can turn on automatic application ID generation in any of the following ways:

- **Specifying the automatic application ID method in the ODBC connection string that is passed to SQLDriverConnect.** For example:

```
...;AutomaticApplicationID=x;
```

where *x* is either 1, 2, or 3.

- **Specifying SQLSetConnectOption.** Immediately after each call to SQLConnect or SQLDriverConnect connecting to the SequeLink ODBC Client, call SQLSetConnectOption as shown:

```
short res_code;
res_code=SQLSetConnectOption(hdbc, 1054, x)
```

where *x* is either 1, 2, or 3.

- **Specifying SQLSetConnectAttr.** Immediately after each call to SQLConnect or SQLDriverConnect connecting to the SequeLink ODBC Client, call SQLSetConnectAttr as shown:

```
SQLSetConnectAttr(hdbc, 1054, x, SQL_IS_INTEGER)
```

where *x* is either 1, 2, or 3.

Specifying Application IDs Using ADO Client Applications

This section describes how to specify application IDs explicitly using ADO client applications and by turning on the automatic generation of application IDs.

Specifying Application IDs Explicitly

Using the SequeLink ADO Client, the client application specifies the following *key-value* pair in the DBPROP_INIT_PROVIDERSTRING property of the DBPROPSET_DBINITALL property set:

```
ApplicationID=MyAppID;
```

where *myAppID* is the application ID.

Generating Application IDs Automatically

Using the SequeLink ADO Client, the client application specifies the following *key-value* pairs in the DBPROP_INIT_PROVIDERSTRING property of the DBPROPSET_DBINITALL property set:

```
Automatic Application ID=x
```

where *x* is either 1, 2, or 3.

Specifying Application IDs Using JDBC Applications

After establishing a connection with the SequeLink JDBC Driver, immediately invoke `setApplicationId`. The `setApplicationId` method is defined on the interface

`com.merant.SIExtensionInterface`, and uses the following method prototype:

```
public void setApplicationId(String s) throws SQLException
```

You can set the application ID as shown in the following example:

```
import java.sql.*;
import com.merant.SIExtensionInterface;

...
Connection con = DriverManager.getConnection(...);

String appId = "myAppID";
if (con instanceof SIExtensionInterface)
{
    SIExtensionInterface slCon = (SIExtensionInterface) con;
    slCon.setApplicationId(myAppID);
}
```

where *myAppID* is the application ID.

Configuring the List of Authorized Application IDs

How you configure the list of authorized application IDs depends on whether the SequeLink Client specifies the application ID explicitly or allows the SequeLink ODBC Client or SequeLink ADO Client to automatically generate an application ID:

- When the application explicitly specifies an application ID, set the `DataSourceApplID` service attribute to the application ID string.
- When the application generates an automatic application ID (SequeLink ODBC Clients and SequeLink ADO Clients only), set the `DataSourceAutoApplID` service attribute to the value of the automatically generated application ID. For instructions on obtaining the value of automatically generated

application IDs, continue with [“Obtaining the Value of Automatically Generated Application IDs”](#) on page 271.

NOTE: The DataSourceApplID and DataSourceAutoApplID service attributes are not, by default, included in a data access service template; therefore, you must explicitly add them. For instructions on adding service attributes, see [“Adding a Service Attribute”](#) on page 69.

Obtaining the Value of Automatically Generated Application IDs

- 1 Turn on the debug log level for the SequeLink service the client application will be using. For example, set ServiceDebugLogLevel=4 (Debug).
- 2 Connect to the SequeLink service with your ODBC or ADO application using the values 1, 2, or 3 to turn on automatic application ID generation:
 - If 1 is specified, the full path of the application executable is used as input for the hash function.
 - If 2 is specified, the executable binary file is used as input for the hash function.
 - If 3 is specified, both the full path of the application executable and the executable binary file are used as input for the hash function.

The connection request will fail and the following message will be generated:

```
[MERANT] [ODBC SequeLink driver] [SequeLink Server]The application specified an invalid application identifier
```

- 3 Open the log file and look for the following entry:

```
CHAIN
  PROVIDE
    refNum      :0
    refNumType  :connect
    direction   :set
    000) Id     :kSSP PID CLOSEDID
    Type       :binary
    Info      :0xGAppID
```

where the set of 40 characters following `Info :0x` is the generated application ID.

- 4 Configure the SequeLink service to accept the generated application ID by setting the `DataSourceAutoApplID` service attribute to the list of IDs you generated in [Step 3](#).

NOTE: Remember to turn off the debug log level for the SequeLink service. Set `ServiceDebugLogLevel=0` (Fatal)

13 Configuring the SequeLink Proxy Server

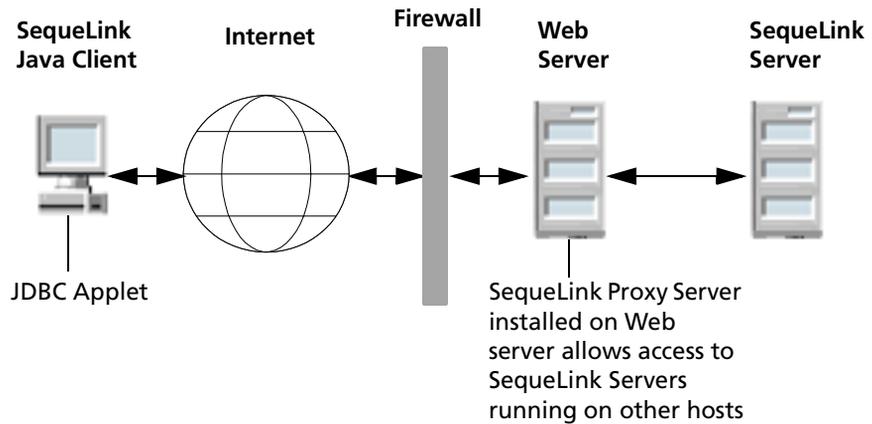
This chapter describes how to configure the SequeLink Proxy Server.

Using the SequeLink Proxy Server

Untrusted applets cannot open a connection to a machine other than the originating host. Therefore, if any SequeLink Java Client will be used by an untrusted applet, your SequeLink Server software must be installed on the same machine as your Web server software. This is a Java restriction. To circumvent this restriction, SequeLink provides a component written in Java that you can install on your Web server host called the *SequeLink Proxy Server*.

Installing the SequeLink Proxy Server on the Web server from which your JDBC applets are downloaded allows untrusted applets to connect to SequeLink Servers on hosts other than the Web server as shown in [Figure 13-1 “SequeLink Proxy Server Installed on a Web Server”](#) on page 274.

Figure 13-1. SequeLink Proxy Server Installed on a Web Server



The SequeLink Proxy Server maps incoming TCP/IP connection requests from the SequeLink Java Client to outgoing TCP connections to other hosts. When the SequeLink Proxy Server receives a connection request on a particular TCP/IP port, the SequeLink Proxy Server establishes a TCP/IP connection to a remote host and transfers data packets between the SequeLink Java Client and the remote host.

In addition, you can use Secure Socket Layer (SSL) encryption with the proxy server to encrypt data between the SequeLink Proxy Server and the SequeLink Java Client. You can also use SSL with a Java application running on your Intranet to secure data over your entire network by installing the SequeLink Proxy Server on the same machine as the SequeLink Server. For example, you may want to use SSL to encrypt the data sent between an application server and the data store serviced by a SequeLink Server on another machine. For more information about SSL, see ["Using SSL Encryption" on page 282](#).

Configuring the SequeLink Proxy Server

Each SequeLink service that is serviced by the SequeLink Proxy Server must be described in a configuration file, *service_name.cfg*, where *service_name* is the name of the service. We recommend that the service name be the same as the SequeLink service that it is servicing. The configuration files are stored in the proxy server directory and use the following *keyword=value* pairs:

Port	The incoming TCP/IP port. The JDBC applet or application must specify this TCP/IP port (and the IP address of the Proxy Server host) in the JDBC connection string.
ServerPort	The TCP/IP port of the service to which the final connection is made. This port must be the same port that is defined in the service configuration on the remote host. A default SequeLink service installation uses the port 19996.
Host	The IP address of the remote host or a symbolic host name.
AdminPort	The TCP/IP port on which the SequeLink Proxy Server listens for administration requests—for example, requests to stop the SequeLink Proxy Server.

NOTE: If you do not want the SequeLink Proxy Server to listen for administration requests, you can omit this keyword from the configuration file. For example, if the SequeLink Proxy Server is installed on a Web server that is accessible by the Internet, you can configure your firewall to block requests from the Internet to the proxy server administration port or you can start the SequeLink Proxy Server without an administration requests listener by omitting the AdminPort keyword from the configuration file.

You can find a configuration file template (proxyserver.cfg) in the proxy server directory. The configuration file must be located in the directory from which you start or stop the SequeLink Proxy Server.

Configuration File Example:

```
Port=4000
ServerPort=4003
Host=189.23.5.132
AdminPort=5000
```

NOTES:

- Keywords in the configuration file are case sensitive.
- Make sure that you use different port numbers for the Port and AdminPort keywords. Also, the port numbers for the Port and AdminPort keywords cannot be used by another TCP/IP service.



- **On Windows NT and Windows 2000**, you can use the SequeLink Manager to obtain the TCP/IP ports used by SequeLink services. In addition, you can verify the TCP/IP ports in the system32\etc\drivers\services file.



- **On UNIX**, you can verify the TCP/IP ports in /etc/services.

Starting and Stopping the SequeLink Proxy Server

This section provides instructions for starting and stopping the SequeLink Proxy Server.

Starting the SequeLink Proxy Server



On Windows NT and Windows 2000:

Open a Windows NT or Windows 2000 command-line window and change the working directory to the proxy server directory. Start the SequeLink Proxy Server by running the command:

```
proxyserver -s [-v jview] configfile
```

where *configfile* is the name of the proxy server configuration file without the .CFG extension. By default, this BAT file uses the JDK JVM. If you want to use the Microsoft Java Virtual Machine (JVM), specify the optional parameter `-v jview` as shown in the preceding example.



On UNIX:

Start the SequeLink Proxy Server by running the shell script:

```
startproxyserver.sh -s configfile
```

where *configfile* is the name of the proxy server configuration file without the .CFG extension. The configuration file must be located in the directory from which you start or stop the SequeLink Proxy Server.

Stopping the SequeLink Proxy Server



On Windows NT and Windows 2000:

Open a Windows NT or Windows 2000 command-line window and change the working directory to the proxy server directory. Stop the SequeLink Proxy Server by running the command:

```
proxyserver -q [-v jview] configfile
```

where *configfile* is the name of the proxy server configuration file without the .CFG extension. By default, this BAT file uses the JDK JVM. If you want to use the Microsoft JVM, specify the optional parameter *-v jview* as shown in the preceding example.



On UNIX:

Stop the SequeLink Proxy Server by running the shell script:

```
proxyserver.sh -q configfile
```

where *configfile* is the name of the proxy server configuration file without the .CFG extension. The configuration file must be located in the directory from which you start or stop the SequeLink Proxy Server.

SequeLink Proxy Server Logging

All messages generated by the SequeLink Proxy Server are written to a log file in the *installdir/proxy/log/* directory, where *installdir* is your installation directory. The log file name has the format:

```
proxy_server_name.log
```

where *proxy_server_name* is the name of the SequeLink Proxy Server. Severe errors and information, such as `server started` or `server stopped` messages display on the screen also.

Using the SequeLink Proxy Server as a Windows NT Service

Before you install the SequeLink Proxy Server as a Windows NT service, check the following requirements:

- Make sure that you have administrator rights. Installing and un-installing the SequeLink Proxy Server as a Windows NT service requires making changes to the HKEY_LOCAL_MACHINE key in the Windows NT Registry.
- Make sure that the directory your JVM is installed and is specified in the correct sequence in the system definition of the PATH environment variable. Because the SequeLink Proxy Server Windows NT service is configured to run under the local system account, access to network resources is not available. If the system definition of the PATH environment variable contains a network directory before the directory in which the JVM is installed, you will not be able to start the SequeLink Proxy Server. If you cannot start the SequeLink Proxy Server, either:
 - Redefine the system definition of the PATH environment variable so that the network directory appears in the system definition after the directory in which the JVM is installed. Then, reboot to make your changes effective for the local system account.
 - Change the definition of the SequeLink Proxy Server Windows NT service to run under an account that has access to the specific network drive. In this case, no console will appear when the SequeLink Proxy Server starts.
- Make sure the CLASSPATH environment variable is defined correctly for your JVM and that the SequeLink Proxy Server .jar files are added to the CLASSPATH.

Installing the SequeLink Proxy Server as a Windows NT Service

- 1 Create a proxy server configuration file.
- 2 Open a Windows NT command window and change the working directory to the proxy subdirectory of the SequeLink Java Client directory.
- 3 Issue the following command:

```
cmdsrvc -s service_name -c [-v jview]
```

where *service_name* is the name of the proxy server configuration file. This command creates a Windows NT service for the SequeLink Proxy Server. Use the Windows NT Event Viewer to verify that the service was created successfully (in the Application log for the source cmdsrvc). By default, the JDK JVM is used. If you want to use the Microsoft JVM, specify the optional parameter `-v jview` as shown in the preceding example.

The Windows NT service that you created should have the following attributes:

- Automatic startup
- Log on as System Account
- Allow service to interact with the desktop

In addition, a Windows NT Event Viewer source is defined with the name of the SequeLink Proxy Server. The SequeLink Proxy Server logs start and stop messages to this source.

- 4 Start the Windows NT service using the Windows NT Services control panel. Because the service is configured for automatic startup, it will also start when the Windows NT machine is initialized.

NOTE: Make sure that the following files located in the proxy/lib directory are added to the CLASSPATH definition of your JVM:

For a SequeLink Proxy Server running in...	Add this file to the CLASSPATH of your JVM...
JDK 1.1.x or Java 2 Platform JVM without SSL	slproxy.jar
Java 2 Platform JVM with SSL or data scrambling enabled	slproxy.jar and ssl.jar
JDK 1.1.x JVM with SSL or data scrambling enabled	slproxy.jar and ssl_11.jar

Un-Installing the SequeLink Proxy Server as a Windows NT Service

Before you un-install the SequeLink Proxy Server as a Windows NT service, make sure that you have administrator rights.

- 1** Stop the SequeLink Proxy Server Windows NT service using the Windows NT Services control panel.
- 2** Open a Windows NT command-line window.
- 3** Change the working directory to the proxy server subdirectory in the SequeLink Java Client directory.
- 4** Issue the following command:

```
cmdsrvc -s service_name -d
```

Using SSL Encryption

If your SequeLink environment requires greater data privacy than that provided by fixed-key DES, fixed-key 3DES, or byteswap, you can use the Secure Socket Layer (SSL) to encrypt data exchanged between the SequeLink Java Client and the SequeLink Proxy Server. This assumes that the communication between the SequeLink Proxy Server machine (for applets, the Web server from which the applets are downloaded) and the SequeLink Server machine is secure, meaning that:

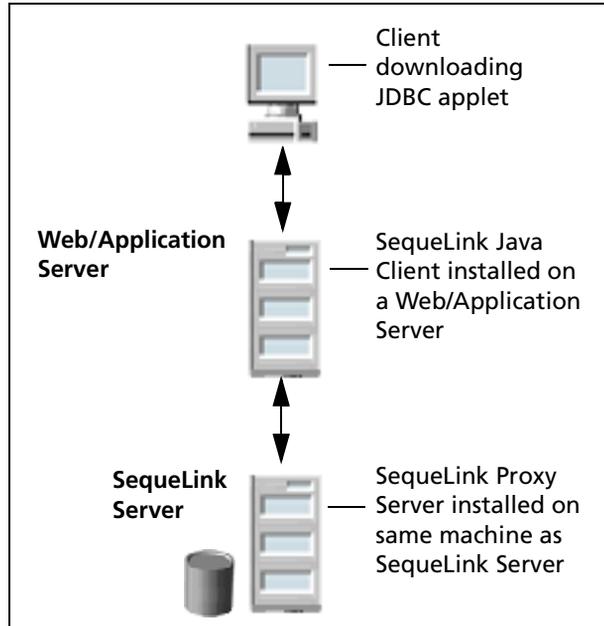
- Only authorized persons can obtain login access to the Web server machine.
- Only authorized persons can eavesdrop on (or monitor) the communication (physical communication lines and any intermediate routers) between the Web server host and the database server host. Because the data on your Intranet is not encrypted, you also must ensure that only authorized access to internal communication lines and internal routers is permitted.

NOTE: SequeLink data scrambling (fixed-key DES, fixed-key 3DES, and byteswap) can work with SSL, resulting in a completely secure combination between the SequeLink Java Client and the SequeLink Proxy Server and between the SequeLink Proxy Server and the SequeLink Server.

Using SSL with a Java application running on your Intranet, you can secure data over your entire network by installing the SequeLink Proxy Server on the same machine as the SequeLink Server (as shown in [Figure 13-2 “Using SSL with the SequeLink Proxy Server Installed on the SequeLink Server” on page 283](#)) and specifying `localhost` as the host name of the SequeLink Server in the proxy server configuration file. The cleartext messages that are sent between the SequeLink Proxy Server and the SequeLink Server do not leave the machine.

Figure 13-2. Using SSL with the SequeLink Proxy Server Installed on the SequeLink Server

Intranet



NOTE: SequeLink uses the IETF TLS (Transport Layer Security) 1.0 standard, the successor to the SSL 3.0 protocol.

SSL Cipher Suites

SSL cipher suite definitions have the format:

SSL_KeyExchangeMethod_WITH_DataTransferCipher_DigestFunction

[Table 13-1](#) lists the cryptographic strong SSL cipher suites supported by SequeLink.

Table 13-1. Strong SSL Cipher Suites Supported by SequeLink

Cipher Suite

SSL_DH_anon_WITH_RC4_128_MD5

SSL_DH_anon_WITH_3DES_EDE_CBC_SHA

SSL_DH_anon_WITH_DES_CBC_SHA

SSL_DHE_DSS_WITH_3DES_EDE_CBC_SHA

SSL_DHE_DSS_WITH_DES_CBC_SHA

SSL_DHE_DSS_WITH_RC4_128_SHA

SSL_DHE_RSA_WITH_3DES_EDE_CBC_SHA

SSL_DHE_RSA_WITH_DES_CBC_SHA

SSL_RSA_WITH_3DES_EDE_CBC_SHA

SSL_RSA_WITH_DES_CBC_SHA

SSL_RSA_WITH_RC4_128_MD5

SSL_RSA_WITH_RC4_128_SHA

Cryptographic Characteristics of Key Exchange Algorithms

Table 13-2 lists the cryptographic characteristics of SSL key exchange algorithms, including a description, the key-size limit, and the type of situation for which specific algorithms are most appropriate.

Table 13-2. Cryptographic Characteristics of Key Exchange Algorithms

Key Exchange Algorithm	Description	When to Use
DH_anon	The Diffie-Hellman parameters are generated during session establishment.	When there is no risk of man-in-the-middle attacks.
DHE_DSS	The Diffie-Hellman parameters are generated during session establishment. They are signed by the DSS certificate.	When the DSS certificate of the server is used for signing only and not used for key exchange.
DHE_RSA	The Diffie-Hellman parameters are generated during session establishment. They are signed by the RSA certificate.	When the RSA certificate of the server is used for signing only and not used for key exchange.
RSA	The public key from the RSA certificate is used for key exchange.	When the server uses an RSA certificate.

Cryptographic Characteristics of Data Transfer Ciphers

Table 13-3 lists the cryptographic characteristics of data transfer ciphers, including the algorithm used and the effective key size.

Table 13-3. Cryptographic Characteristics of Data Transfer Ciphers

Data Transfer Cipher	Algorithm	Effective Key size
DES_CBC	DES in cipher block chaining mode	56
3DES_EDE_CBC	Triple DES in cipher block chaining mode	168
RC4	RC4 from RSA	128

Configuring SSL Encryption for the SequeLink Proxy Server

You configure SSL encryption in the proxy server configuration file by adding the *keyword=value* pairs:

```
Network=ssl
CipherSuites=value
```

NOTES:

- 1 The `Network` and `CipherSuites` keywords in the proxy server configuration file are case sensitive.
- 2 If you do not want to use SSL, specify `Network=socket` in the proxy server configuration file or omit the `Network` keyword from the configuration file.

- 3 The value of the CipherSuites keyword is a list of cipher suites to use, in order of preference. The listed cipher suites are separated by commas with no blank spaces allowed. You must specify cipher suites that use the same type of certificate. For example, you cannot specify a combination of RSA cipher suites and DSS cipher suites. For a list of supported cipher suites, see [“SSL Cipher Suites” on page 284](#).
- 4 For cipher suites that require a DSS or RSA certificate, you must specify the X.509 certificate (with the public key) and the corresponding private key in the proxy server configuration file. See [Table 13-4](#) for a list of the keyword=value pairs you can specify in the proxy server configuration file for each key exchange algorithm.
- 5 When the SequeLink Java Client and the SequeLink Proxy Server agree on a cipher suite that requires a certificate, the SequeLink Java Client must specify the certificate checker class that will be used to verify the certificate chain the SequeLink Proxy Server sends to the SequeLink Java Client. For more information on certificate checker classes, see [“Verifying the SequeLink Proxy Server Certificate” on page 293](#).

Table 13-4 lists the key exchange algorithms you can use and the *keyword=value* pairs you can specify in the proxy server configuration file when using a particular key exchange algorithm.

Table 13-4. Key Exchange Algorithms and Keyword/Value Pairs for the Proxy Server

Key Exchange Algorithm	Keyword	Value
DHE_DSS	DSSCertificate	Name of the file with the DSS certificate in DER format or a PKCS #7 certificate chain.
	DSSPrivateKey	Name of the file with the DSS private key in PKCS #8 encrypted format.
	PassPhrase	Pass phrase with which the private key file is encrypted. If this keyword is unspecified, the Proxy Server will prompt for the pass phrase.
	UsePassPhraseDialog	To be prompted for the pass phrase using the standard input/output instead of a dialog box, set this keyword to <code>No</code> . Remember that the pass phrase will be shown on the screen as you type.
DHE_RSA	RSACertificate	Name of the file with the RSA certificate in DER format or a PKCS #7 certificate chain.
	RSAPrivateKey	Name of the file with the RSA private key in PKCS #8 encrypted format.
	PassPhrase	Pass phrase with which the private key file is encrypted. If this keyword is unspecified, the Proxy Server will prompt for the pass phrase.
	UsePassPhraseDialog	To be prompted for the pass phrase using the standard input/output instead of a dialog box, set this keyword to <code>No</code> . Remember that the pass phrase will be shown on the screen as you type.

Table 13-4. Key Exchange Algorithms and Keyword/Value Pairs for the Proxy Server (cont.)

Key Exchange Algorithm	Keyword	Value
RSA	RSACertificate	Name of the file with the RSA certificate in DER format or a PKCS #7 certificate chain.
	RSAPrivateKey	Name of the file with the RSA private key in PKCS #8 encrypted format.
	PassPhrase	Pass phrase with which the private key file is encrypted. If this keyword is unspecified, the Proxy Server will prompt for the pass phrase.
	UsePassPhraseDialog	To be prompted for the pass phrase using the standard input/output instead of a dialog box, set this keyword to NO. Remember that the pass phrase will be shown on the screen as you type.

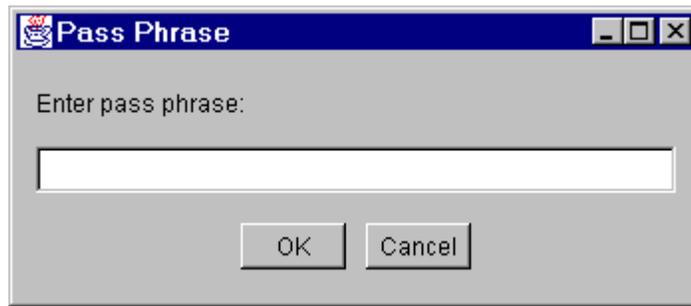
Using Private Keys with the SequeLink Proxy Server

The SSL cipher suites that use server authentication require a valid server certificate and associated private key. The SequeLink Proxy Server must access the private key from a private key file. Because it is not safe to store the private key as cleartext in a file, the SequeLink Proxy Server expects the private key to be stored in PKCS #8 format, which is a standard method of storing encrypted private keys when the encryption key is derived from a pass phrase.

Providing the Pass Phrase for the SequeLink Proxy Server

The SequeLink Proxy Server requires the pass phrase to start. The private key can be retrieved in either of the following ways:

- *When the SequeLink Proxy Server starts, it prompts for the private key. In graphical user interface (GUI) environments, a dialog box may appear. For example:*



Type the pass phrase in the appropriate field of the dialog box and click **OK**.

In situations without a GUI, such as when the SequeLink Proxy Server is running in a terminal session on a UNIX machine, specify `UsePassPhraseDialog=No` in the proxy server configuration file. The SequeLink Proxy Server will use the standard input/output of your environment to prompt for the private key. When you type the pass phrase and press ENTER, the pass phrase displays on your standard output. When you are finished, make sure to scroll the output window so that unauthorized persons cannot see the pass phrase on your screen.

- *You can code the pass phrase in the proxy server configuration file. Add the keyword=value pair:*

```
PassPhrase=pass_phrase
```

where `pass_phrase` is the pass phrase required to access the private key. Leading and trailing blanks are stripped from the

value when the pass phrase is retrieved from the configuration file; therefore, the pass phrase cannot have leading or trailing blanks in the configuration file. Make sure that only trusted accounts have access to the configuration file.

NOTE: If the SequeLink Proxy Server will be started as a Windows NT service, you must specify the pass phrase in the configuration file because the SequeLink Proxy Server cannot prompt for the pass phrase.

Storing the Private Key in PKCS #8 Format

If your private key is in cleartext format, you can use the `encrypt.bat` utility (on Windows NT) or the `encrypt.sh` shell script (on UNIX) to store the key in a file in PKCS #8 format.

The private keys are encrypted with triple DES with a 168-bit key derived from the pass phrase using a one-way hash function (SHA).

To provide sufficient randomness in the generated keys, you must provide sufficient randomness in the pass phrase. The English language has approximately 1.3 bits of randomness for each character; therefore, to provide 168 random bits for the two keys, you must have 130 characters (conservatively) of English text. Using punctuation characters and a mix of upper and lowercase letters, you can construct pass phrases that have more randomness with fewer characters.

Using the Encryption Tool



On Windows NT and Windows 2000:

```
encrypt [-v virtual_machine] infile outfile
```

where:

virtual_machine is the executable name of the JVM that is installed on the machine where you encrypt the key. By default, this BAT file uses the JDK JVM. If you want to use the Microsoft JVM, specify the optional parameter `-v jview`.

infile is the name of the cleartext file.

outfile is the name of the encrypted file.



On UNIX:

```
encrypt.sh infile outfile
```

where:

infile is the name of the cleartext file.

outfile is the name of the encrypted file.

You may want to run the encryption tool on a machine other than the one running the SequeLink Proxy Server and transfer the encrypted file to the SequeLink Proxy Server host to avoid writing a copy of the private key in cleartext on the SequeLink Proxy Server host. Make sure that you transfer the complete proxy/lib directory to the machine on which you want to run the encryption tool.

The proxy server installation directory also contains a decryption tool that can be used to decrypt a file that has been encrypted with the encryption tool. The encryption and decryption tools prompt for the pass phrase and show it on the screen as you type, so make sure that you close the terminal session window after

you have encrypted or decrypted the file to prevent unauthorized people from viewing it.

Using the Decryption Tool



On Windows NT and Windows 2000:

```
decrypt [-v virtual_machine] infile outfile
```

where:

virtual_machine is the executable name of the JVM that is installed on the machine where you encrypt the key. By default, this BAT file uses the JDK JVM. If you want to use the Microsoft JVM, specify the optional parameter `-v jview`.

infile is the name of the encrypted file.

outfile is the name of the cleartext file.



On UNIX:

```
decrypt.sh infile outfile
```

where:

infile is the name of the encrypted file.

outfile is the name of the cleartext file.

Verifying the SequeLink Proxy Server Certificate

When you use a cipher suite that specifies server authentication, the SSL handshake protocol ensures that the server knows the private key that corresponds to the public key in the certificate. Subsequently, the client application must verify that the server is indeed the server with which it wants to communicate by

verifying that the received certificate is the certificate that it expects from the server.

The JDBC application or applet provides the SequeLink Java Client with a class that implements the `com.merant.sequelink.cert.CertificateCheckerInterface` interface. If you do not supply a class that implements this interface, the connection will be refused. This interface is defined as:

```
package com.merant.sequelink.cert;
public interface CertificateCheckerInterface
{
    public void CheckCertificate(byte [][] certChain)
        throws SecurityException;
}
```

The SequeLink JDBC Driver calls this method and passes the X.509 certificate chain that it received during the SSL handshake to the method. All certificates are DER encoded and the server certificate is the first certificate in the array. The `checkCertificate` method must verify that the received certificate is trusted and is, for example, signed by a trusted authority. If the certificate is not trusted, the method must throw a `SecurityException`. You specify the name of the class that implements this interface in the `certificateChecker` keyword in the JDBC connection URL or the data source.

The driver/examples subdirectory contains the Java source files listed in [Table 13-5](#) as examples of classes that implement `CertificateCheckerInterface`.

Table 13-5. Java Source Files that Implement `CertificateCheckerInterface`

Java Source File	Description
<code>CheckAgainstCertificateFromJar.java</code>	Adapt and use for downloaded applets.
<code>CheckAgainstCertificateFromFile.java</code>	Adapt and use for Java applications on a client machine.
<code>KeyStoreCertificateChecker.java</code>	Adapt and use for Java applications that use a Java 2 keystore to verify that the provided certificate chain is trusted.

These classes retrieve the server certificate from a JAR file, or local file, and compare it with the certificate that is passed as the first element of the `certChain` parameter to the `checkCertificate` method. You can change these files as appropriate for your environment.

Coding the certificate you want to compare other certificates against in the downloaded applet is safe only if no one tampers with the applet while it is downloaded from your Web server. This means that you must use signed applets and that you must configure your Web browser to explicitly check the signer of the downloaded applets, or that you must, alternatively, use a secure and authenticated SSL connection to the web server when downloading the applet.

Using the Demo Certificates, Certificate Checker, and Private-Key Format Conversion Tool

SequeLink provides some demo applications in the *installdir/proxy/demos* directory, where *installdir* is your installation directory, that allow you to create or convert certificates.

Demo Certificates

The demo certificates that SequeLink provides are intended for testing purposes only and cannot be used to provide secure connections. [Table 13-6](#) lists the private key files and describes its corresponding certificate.

Table 13-6. Demo Certificates

File	Descriptions
demo-DSA-CA.cer	Demo Certificate Authority with a DSS X.509 certificate. This certificate is self signed.
demo-DSA-CA.pk8	Corresponding (PKCS #8 encrypted) private key of the public key provided by the certificate demo-DSA-CA.cer.
demo-DSA-server.p7b	Demo DSS server X.509 certificate signed with the public key provided by the certificate demo-DSA-CA.cer.
demo-DSA-server.pk8	Corresponding (PKCS #8 encrypted) private key of the public key provided by the certificate demo-DSA-server.cer.
demo-RSA-CA.cer	Demo Certificate Authority with an RSA X.509 certificate. This certificate is self signed.

Table 13-6. Demo Certificates (cont.)

File	Descriptions
demo-RSA-CA.pk8	Corresponding (PKCS #8 encrypted) private key of the public key provided by the certificate demo-RSA-CA.cer.
demo-RSA-server.p7b	Demo RSA server X.509 certificate signed with the public key provided by the demo-RSA-CA.cer.
demo-RSA-server.pk8	Corresponding (PKCS #8 encrypted) private key of the public key provided by the certificate demo-RSA-server.cer.

NOTES:

- To use the demo certificates, you must add all the .jar files in the *installdir/proxy/lib* directory and the *installdir/proxy/demos/* directory to your CLASSPATH variable, where *installdir* is your installation directory.
- You can re-generate demo certificates by running the following Java program in the *installdir/proxy/* directory, where *installdir* is your installation directory:

```
java com.merant.sequelink.demo.GenerateDemoCertificates
```

- You can customize the generation of these demo certificates by editing the demo.properties file in the *installdir/proxy/demos/com/merant/sequelink/demo* directory, where *installdir* is your installation directory.

The following examples show how to use the demo certificates.

Example A: Using SSL with an RSA Server Certificate

- 1 Start the SequeLink Proxy Server with the following configuration:

```
Port=9500
AdminPort=9600
Host=SequeLinkhost
ServerPort=SequeLinkport
Network=ssl
CipherSuites=SSL_DHE_RSA_WITH_3DES_EDE_CBC_SHA,SSL_
DHE_RSA_WITH_DES_CBC_SHA,SSL_RSA_WITH_3DES_EDE_CBC_
SHA,SSL_RSA_WITH_DES_CBC_SHA,SSL_RSA_WITH_RC4_128_MD5,
SSL_RSA_WITH_RC4_128_SHA
RSACertificate=cert/demo-RSA-server.p7b
RSAPrivateKey=cert/demo-RSA-server.pk8
PassPhrase=Demo Pass Phrase
```

where *SequeLinkhost* is the TCP/IP host name or address of the SequeLink Server and *SequeLinkport* is the port on which the SequeLink Server is listening for connection requests.

- 2 Make a connection to the SequeLink Server, for example, using JDBC Test:

```
jdbc:sequelink:ssl://proxyserverhost:9500;
cipherSuites=SSL_RSA_WITH_RC4_128_MD5;
certificateChecker=com.merant.sequelink.cert.
AcceptAllCertificateChecker
```

where *proxyserverhost* is the IP address or symbolic host name of your proxy server host.

If successful, the following message appears:

```
Certificate accepted by
AcceptAllCertificateChecker.
*** ONLY FOR TESTING PURPOSES ***
Certificate chain:
1: O=SequeLink Demo Certificates, OU=Demo RSA
Server Certificate, CN=demo.sequelink.merant.com
```

```
2: O=SequeLink Demo Certificates, CN=Demo RSA CA
Certificate
```

Example B: Using SSL with a DSS Server Certificate

1 Start the proxy server with the following configuration:

```
Port=9500
AdminPort=9600
Host=SequeLinkhost
ServerPort=SequeLinkport
Network=ssl
CipherSuites=SSL_DHE_DSS_WITH_3DES_EDE_CBC_SHA,SSL_
DHE_DSS_WITH_DES_CBC_SHA,SSL_DHE_DSS_WITH_RC4_128_SHA
DSSCertificate=cert/demo-DSS-server.p7b
DSSPrivateKey=cert/demo-DSS-server.pk8
PassPhrase=Demo Pass Phrase
```

where *SequeLinkhost* is the TCP/IP host name or address of the SequeLink Server and *SequeLinkport* is the port on which the SequeLink Server is listening for connection requests.

2 Make a connection to the SequeLink Server, for example, using JDBC Test:

```
jdbc:sequelink:ssl://proxyserverhost:9500;
cipherSuites=SSL_DHE_DSS_WITH_DES_CBC_SHA;
certificateChecker=com.merant.sequelink.cert.
AcceptAllCertificateChecker
```

where *proxyserverhost* is the IP address or symbolic host name of your proxy server host.

If successful, the following message appears:

```
Certificate accepted by
AcceptAllCertificateChecker.
*** ONLY FOR TESTING PURPOSES ***
Certificate chain:
1: O=SequeLink Demo Certificates, OU=Demo DSA
Server Certificate, CN=demo.sequelink.merant.com
2: O=SequeLink Demo Certificates, CN=Demo DSA CA
Certificate
```

Example C: Using SSL with Anonymous Cipher Suites (No Server Authentication)

- 1 Start the proxy server with the following configuration:

```
Port=9500
AdminPort=9600
Host=sequelinkserver
ServerPort=sequelinkport
Network=ssl
CipherSuites=SSL_DH_anon_WITH_3DES_EDE_CBC_SHA,SSL_
DH_anon_WITH_DES_CBC_SHA,SSL_DH_anon_WITH_RC4_128_MD5
```

where *SequeLinkhost* is the TCP/IP host name or address of the SequeLink Server and *SequeLinkport* is the port on which the SequeLink Server is listening for connection requests.

- 2 Make a connection to the SequeLink Server, for example, using JDBC Test:

```
jdbc:sequelink:ssl://proxyserverhost:9500;
cipherSuites=SSL_DH_anon_WITH_DES_CBC_SHA
```

where *proxyserverhost* is the IP address or symbolic host name of your proxy server host.

Demo Certificate Checker

SequeLink provides a demo certificate checker that accepts all server certificates. It displays on the screen a warning and a description of the certificate the client received from the server through the SSL handshake. This certificate checker is implemented by the `com.merant.sequelink.cert.AcceptAllCertificateChecker` class.

Demo Private-Key Format Conversion Tool

SequeLink provides a private-key format conversion tool that can perform either of the following tasks:

- Export a private key and X.509 certificate from a Java 2 Platform keystore to an encrypted PKCS #8 private-key file and DER-encoded certificate file
- Export a private key and X.509 certificate from a PKCS #12 file

The private-key format conversion tool is a command-line tool that uses the following syntax:

```
java.com.merant.sequelink.demo.KeyTool
[-keystore keystore]
[-alias alias]
-certfile certfile
-keyfile keyfile
[-storetype storetype]
[-storepass storepass]
[-keypass keypass]
```

where:

Parameter	Java 2 Platform Keystore Export	PKCS #12 File Export	Description
<i>keystore</i>	✓	✓	The file name of the Java 2 Platform keystore or the PKCS #12 file.
<i>alias</i>	✓		The alias in the Java 2 Platform keystore. If supplied, it is assumed that the keystore parameter is a Java 2 Platform keystore.
<i>certfile</i>	✓	✓	The DER-encoded X.509 certificate file.

Parameter	Java 2 Platform Keystore Export	PKCS #12 File Export	Description
<i>keyfile</i>	✓	✓	The PKCS #8 encoded private key. The private key ends with the same password as the Java 2 Platform keystore or the PKCS #12 file.
<i>storetype</i>	✓	✓	The type of Java 2 Platform keystore. The default is jks. This parameter is optional.
<i>storepass</i>	✓		The password used to protect the Java 2 Platform keystore or the PKCS #12 file. If omitted, you will be prompted for this password.
<i>keypass</i>	✓		The password that protects the Java 2 Platform key entry. This parameter is required when the password for the key entry is different from the keystore password.

To use the demo private-key format conversion tool, you must add all the .jar files in your *installdir/proxy/lib* directory and the *installdir/proxy/demos/* directory (where *installdir* is your installation directory) to your CLASSPATH.

Part 4: Reference

This part contains the following appendixes:

- [Appendix A “Using LDAP with SequeLink ODBC and ADO Clients” on page 305](#) explains how SequeLink Clients use LDAP directories to retrieve connection information and describes how to create and update LDAP entries for SequeLink services.
- [Appendix B “SequeLink Manager Commands” on page 309](#) lists all available SequeLink Manager commands.
- [Appendix C “Operator Interface Commands for OS/390” on page 347](#) lists all available Operator Interface commands by category.
- [Appendix D “SequeLink Service Attributes” on page 361](#) lists the SequeLink Manager attributes you can use to configure and manage your SequeLink environment.
- [Appendix E “SequeLink Events” on page 415](#) lists and defines the SequeLink events, the attributes associated with events, and explains how to write a filter for an event.

A Using LDAP with SequeLink ODBC and ADO Clients

This appendix explains how SequeLink Clients use LDAP directories to retrieve connection information and describes how to create and update LDAP entries for SequeLink services.

What is LDAP?

SequeLink Clients can connect directly to a SequeLink Server or retrieve connection information from a Lightweight Directory Access Protocol (LDAP) directory. LDAP is a standard protocol for accessing and updating common directory information. Storing connection information centrally in an LDAP directory provides flexibility to make environment changes and reduces the time it takes to reconfigure your infrastructure when a change takes place.

For example, if a database must be moved to a different server, you do not have to reconfigure the user applications or the client data sources that must now access the new server. Because the connection information is stored in an LDAP directory, you need only update the LDAP directory entries so that the SequeLink Clients can connect to the new server.

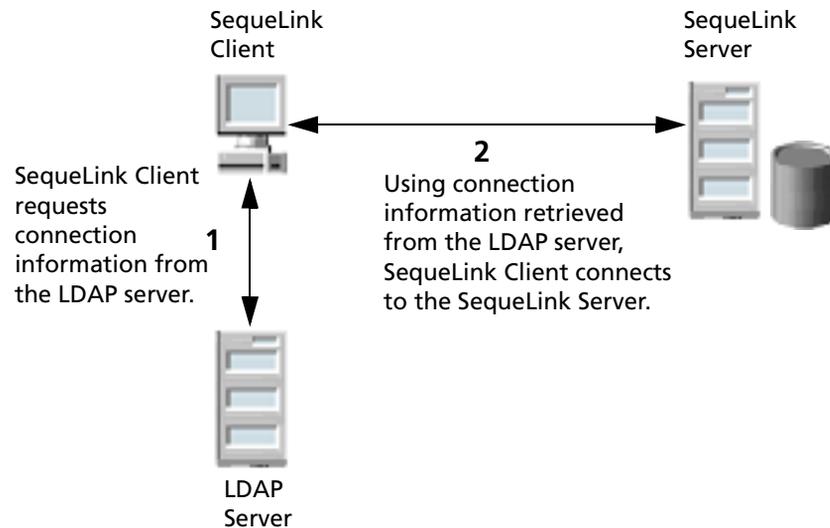
SequeLink supports all LDAP V3 implementations, including Microsoft Active Directory and Netscape Directory Server.

Retrieving Connection Information from LDAP Directories

When a SequeLink Client retrieves connection information from an LDAP directory, the connection to the SequeLink Server takes place as a two-step process as shown in [Figure A-1](#).

- 1 The SequeLink Client connects to the LDAP server and retrieves connection information from an LDAP entry.
- 2 Using the connection information retrieved from the LDAP entry, the SequeLink Client connects to the SequeLink Server.

Figure A-1. Retrieving Connection Information from an LDAP Directory



To retrieve connection information from an LDAP directory, you configure the following information at the SequeLink Client:

LDAP Server Host	is the TCP/IP host name of the LDAP server.
LDAP Server Port	is the TCP/IP port that the LDAP server is listening on for incoming connection requests. If unspecified, the SequeLink Client will use the default LDAP port 389.
Distinguished Name (DN)	is an identifier that uniquely identifies the LDAP entry where connection information is stored. For information about what you must include in an LDAP entry, see “Creating LDAP Entries for SequeLink Services” on page 307.

For information about configuring SequeLink ODBC Clients and SequeLink ADO Clients to connect to an LDAP server to retrieve connection information:

- See [Chapter 9 “Configuring the SequeLink ODBC Client”](#) on page 177
- See [Chapter 10 “Configuring the SequeLink ADO Client”](#) on page 203

Creating LDAP Entries for SequeLink Services

If you are using LDAP directories to store connection information for SequeLink services, you must create a single LDAP directory entry for each SequeLink service and identify that LDAP directory entry by a Distinguished Name (DN). The LDAP entry must contain the TCP/IP host name of the SequeLink Server and the TCP/IP port on which the SequeLink Server is listening. Optionally, the LDAP entry can contain a server data source to use for the connection to the SequeLink Server. If a server data source is not specified, the default data source is used by the client.

Table A-1 shows an example of an LDAP directory entry and attributes you may want to store in an LDAP entry for a SequeLink service.

Table A-1. Example of an LDAP Directory Entry for a SequeLink Service

Attribute	Syntax	Description	Example	Required?
SequeLinkHost	cis	The TCP/IP host name or the TCP/IP address on which the SequeLink Server is running.	123.4.5.6 dino.yourcompany	Yes
SequeLinkPort	cis	The TCP/IP port on which the SequeLink Server is listening.	5004	Yes
ServerDataSource	cis	A server data source to use for the connection.	Sales	No

How you create LDAP entries depends on the LDAP product you are using. For instructions on creating LDAP entries, refer to your LDAP product documentation.

Updating LDAP Entries for SequeLink Services

You must update LDAP directory entries for SequeLink services when a:

- New SequeLink service is installed or added
- SequeLink service is assigned a new IP address or port
- SequeLink data source is created or deleted
- SequeLink data source is renamed

For instructions on updating LDAP directory entries, refer to your LDAP product documentation.

B SequeLink Manager Commands

This appendix lists all available SequeLink Manager commands in alphabetical order. For information about starting the SequeLink Manager Command-Line Tool, see [“Invoking the SequeLink Manager Command-Line Tool” on page 100](#).

IMPORTANT:

- SequeLink Manager command names are not case-sensitive; however, the command parameter *service_name* is case-sensitive.
- If the value of a command parameter contains spaces, the value must be enclosed within single quotes (') or double quotes (").
- If the value of a command parameter contains single or double quotes, use single quotes to quote double quotes and double quotes to quote single quotes.
- The pound sign (#) is a comment character. All text that follows the pound sign on the same line is ignored.
- When issuing commands using the direct or batch method, you must specify all of a command's required and optional parameters in the correct position (specify the parameters in the order they are documented). For more information about direct and batch methods of issuing commands, see [“Direct Command Execution” on page 98](#) and [“Batch Command Execution” on page 98](#).

About | a

Prints to the console the version of the SequeLink Manager Command-Line Tool and copyright information.

Syntax {about | a}

Example about

ActivateLocalConfig | alc

Connects to the SequeLink Agent on a local machine.

Syntax {ActivateLocalConfig | alc}

Example alc

ActivateOfflineConfig | aoc

Opens the local configuration file.

Syntax {ActivateOfflineConfig | aoc} *configuration_file*

where *configuration_file* is the path and name of local configuration file.

Example aoc "c:\Program Files\Merant\SLSERVER51\cfg\swandm.ini"

NOTE: The path is enclosed in quotes because there is a space in the path name. Otherwise, the path would not have to be quoted, for example, aoc c:\Merant\cfg\swandm.ini.

ActivateRemoteConfig | arc

Connects to a remote SequeLink Agent.

Syntax {ActivateRemoteConfig | arc} *agent_connection_info*

where *agent_connection_info* is the information required to connect to the SequeLink Agent—host:port, which is the host name and port of the server on which the SequeLink Agent resides.

Example arc caspar.merant.be:7500

CloseConfig | cc

Closes the activated configuration.

Syntax {CloseConfig | cc}

Example cc

DataSourceAttributeAdd | dsaa

Adds an attribute to the specified server data source and the specified SequeLink service.

Syntax {DataSourceAttributeAdd | dsaa} *service_name*
data_source_name attribute_name value

where:

service_name is the name of a data access service. Service names can be obtained using the ServiceList | sl command.

data_source_name is the name of the server data source for which you want to add an attribute. This server data source must belong to the data access service you specified.

attribute_name is the name of the attribute you want to add.

value is the value for the attribute.

For a list of SequeLink service attributes and their valid values, see [Appendix D “SequeLink Service Attributes” on page 361](#).

Example

In the following example, the DataSourceCurrentCatalog attribute is being added to the DS_Employees server data source that belongs to the SLOracle8 data access service. The value for the attribute is employees.

```
dsaa SLOracle8 DS_Employees DataSourceCurrentCatalog
employees
```

DataSourceAttributeDelete | dsad

Deletes an attribute from a server data source.

Syntax

```
{DataSourceAttributeDelete | dsad} service_name
data_source_name attribute_name
```

where:

service_name is the name of a data access service. Service names can be obtained using the ServiceList | sl command.

data_source_name is the name of the server data source from which you want to delete an attribute. This server data source must belong to the data access service you specified.

attribute_name is the name of the attribute you want to delete.

For a list of SequeLink service attributes and their valid values, see [Appendix D “SequeLink Service Attributes” on page 361](#).

Example

The following example deletes the DataSourceCurrentCatalog attribute from the DS_Employees server data source that belongs to the SLOracle8 data access service.

```
dsad SLOracle81 DS_Employees DataSourceCurrentCatalog
```

DataSourceAttributeReplace | dsar

Changes the value of a server data source attribute.

Syntax

```
{DataSourceAttributeReplace | dsar} service_name  
data_source_name attribute_name value
```

where:

service_name is the name of a data access service. Service names can be obtained using the ServiceList | sl command.

data_source_name is the name of the server data source that you want to modify. This server data source must belong to the data access service you specified.

attribute_name is the attribute for which you want to change the value.

value is the new value of the attribute.

For a list of SequeLink service attributes and their valid values, see [Appendix D “SequeLink Service Attributes” on page 361](#).

Example

The following example changes the value of the DataSourceCurrentCatalog attribute in the DS_Employees server data source that belongs to the SLOracle8 data access service. The value is changed to partners.

```
dsar SLOracle8 DS_Employees DataSourceCurrentCatalog  
partners
```

DataSourceCreate | dsc

Creates a server data source.

Syntax {DataSourceCreate | dsc} *service_name data_source_name*

where:

service_name is the name of the data access service in which to create the new server data source.

data_source_name is the name of the server data source you want to create.

Example The following example creates a server data source named DS_Employees within the SLOracle8 data access service.

```
dsc SLOracle8 DS_Employees
```

DataSourceDelete | dsd

Deletes a server data source.

Syntax {DataSourceDelete | dsd} *service_name data_source_name*

where:

service_name is the name of the data access service from which to delete a server data source. Service names can be obtained using the ServiceList | sl command.

data_source_name is the name of the server data source you want to delete.

Example The following example deletes the DS_Employees server data source from the SLOracle8 data access service.

```
dsd SLOracle8 DS_Employees
```

DataSourceInfo | dsi

Lists all attributes and their values for a server data source.

Syntax

```
{DataSourceInfo | dsi} service_name data_source_name
```

where:

service_name is the name of a data access service. Service names can be obtained using the `ServiceList | sl` command.

data_source_name is the name of the server data source for which you want to list attributes and their values. This server data source must belong to the data access service you specified.

For a list of SequeLink service attributes and their valid values, see [Appendix D “SequeLink Service Attributes” on page 361](#).

Example

The following example lists attributes and their values for the `DS_Employees` server data source. This server data source belongs to the `SLOracle8` data access service.

```
dsi SLOracle8 DS_Employees
```

DataSourceList | dsl

Lists all available SequeLink server data sources.

Syntax

```
{DataSourceList | dsl}
```

Example

```
dsl
```

Echo | e

Echoes a user-defined string. This command is useful when you issue commands from a file. For example, you could issue the `DataSourceCreate` command and use the `Echo` command to

display text that says "A new data source was created in the SLOracle8 data access service."

Syntax {Echo | e} *string*

where *string* is the text you want displayed to your console. If the string contains spaces, you must surround the string with either double or single quotes.

Example echo "Testing echo command."

EventList | el

Lists events from a specified data access service or from a specified event trace file.

Syntax {eventlist | el} *service_name* | [remote]file=*event_trace_file_name*
 [details]
 [[{service | srvc}] |
 [{session | sess}] |
 [{statement | stmt}] |
 [{transaction | trans}] |
 [{network | net}] |
 [{error | err}] |
 [{other | oth}]]]
 [count=[{ + | - }] {all | *number*}]
 [offset={begin | end} [{ + | - }]*number*]
 [query='*custom_event_filter_string*']

where:

service_name is the name of a data access service. The event trace file for this specified service will be listed. Service names can be obtained using the ServiceList | sl command.

event_trace_file_name is the path and name of the event trace file you want to list.

number is the event number of events to list when used with the count option. When used with the offset option, *number* is the number of the event from which to start listing events. For example, if `offset=10`, SequeLink would list all events starting with event 10. Another example, if you specify `count=20` and `offset=begin`, SequeLink will list the first 20 events. If you specify `count=20` and `offset=5`, SequeLink will list 20 events starting from event 5.

custom_event_filter_string is an event filter statement. See ["Filtering Events" on page 422](#).

Options

Details: If you specify `Details`, SequeLink will list detail information about the event.

Event Types: You can specify one or more of the following event groups for which to list event information: `Service`, `Session`, `Statement`, `Transaction`, `Error`, or `Other`. When you specify one or more of the event groups, SequeLink Manager lists all the events of the type you specified. For example, if you specify `Service`, SequeLink lists all service events such as `Service Started` and `Service Stopping` (these events start with "Service"). Event names that do not start with `Service`, `Session`, `Network`, `Error`, `Statement`, or `Transaction` are `Other` events (for example, `Cursor Closed`).

Examples

Local host or remote configuration examples:

Example A: The following example lists detailed event information for the SLAgent service.

```
e1 SLAgent details
```

Example B: The following example lists detailed event information for all service events starting with event number 10 in the event trace file associated with the SLOracle data access service.

```
e1 SLOracle details service count=all offset=10
```

Example C: The following example defines a query for the information it will list for the SLOracle80 data access service. The query returns all SQL statements that do not return a return code of 0.

```
el SLOracle80 stmt query='${ReturnCode} != 0'
```

Example D: The following example lists event information for the first 10 events in the local file named SLOracle81.trc.

```
el "file=C:\ProgramFiles\Merant\SLSERVER51\tracing\  
SLOracle81.trc" count=10
```

Example E: The following example lists detailed event information for only service events in the remote file named SLOracle81.trc.

```
el "remotefile=C:\ProgramFiles\Merant\SLSERVER51\tracing\  
SLOracle81.trc" service details
```

Offline configuration examples:

Example A: The following example lists event information from the local file named SLOracle81.trc file.

```
el "file=C:\ProgramFiles\Merant\SLSERVER51\tracing\  
SLOracle81.trc"
```

Example B: The following example lists event information for the first 10 events in the local file named SLOracle81.trc.

```
el "file=C:\ProgramFiles\Merant\SLSERVER51\tracing\  
SLOracle81.trc" count=10
```

Example C: The following example lists event information from the local file named SLOracle81.trc, starting from the end of the file and listing all events.

```
el "file=C:\ProgramFiles\Merant\SLSERVER51\tracing\  
SLOracle81.trc" count=-all offset=end
```

Example D: The following example lists only session and service event information from the local file named SLoracle81.trc., starting with the fifth event.

```
e1 "file=C:\ProgramFiles\Merant\SLSERVER51\tracing\
SLoracle81.trc" offset=5 service session
```

Example E: The following example lists detailed event information for service events only from the local file named SLoracle81.trc.

```
e1 "file=C:\ProgramFiles\Merant\SLSERVER51\tracing\
SLoracle81.trc" service details
```

EventExport | ee

Exports events from a specified service or specified event trace file to a text file or XML file.

Syntax

```
{eventlist | el} service_name | [remote]file=event_trace_file_name
export_format export_file_name | [remote]file=
event_trace_file_name|
[ [ [{service | svc}] |
[{session | sess}] |
[{statement | stmt}] |
[{transaction | trans}] |
[{network | net}] |
[{error | err}] |
[{other | oth}] ] ]
[count=[{ + | - }] {all | number}]
[offset={begin | end} [{ + | - }]number]
[query='custom_event_filter_string']
```

where:

service_name is the name of a data access service. The event trace file from the specified service is listed. Service names can be obtained using the ServiceList | sl command.

event_trace_file_name is the path and name of the event trace file.

export_format is the format of the file to which you want to export the events, where:

- {delimited_txt | deltxt} is a text file with commas separating each event you export
- {raw_xml | rxml} is a well-formed XML file.
- {validated_xml | vxml} is a valid XML file.

export_file_name is the path and name of the file to which you are exporting the events.

number is the event number of events to export when used with the count option. When used with the offset option, number is the number of the event from which to start exporting events. For example, if offset=10, SequeLink would export all events starting with event 10. Another example, if you specify count=20 and offset=begin, SequeLink will export the first 20 events. If you specify count=20 and offset=5, SequeLink will export 20 events starting from event 5.

custom_event_filter_string is an event filter statement. See [“Filtering Events” on page 422](#).

Options

Event Types: You can specify one or more of the following event groups for which to export event information: Service, Session, Statement, Transaction, Error, or Other. When you specify one or more of the event groups, SequeLink Manager exports all the events of the type you specified. For example, if you specify Service, SequeLink exports all service events such as Service Started and Service Stopping (these events start with "Service"). Event names that do not start with Service, Session, Network, Error, Statement, or Transaction are Other events (for example, Cursor Closed).

Examples

Local host or remote configuration examples:

Example A: The following example exports event information in the local file named `SLoracle81.trc` to a text file named `export.txt`.

```
ee "file=C:\ProgramFiles\Merant\SLSERVER51\tracing\
SLoracle81.trc" deltxt export.txt
```

Example B: The following example exports event information for only service events in the remote file named `SLoracle81.trc` to a valid XML file named `export.xml`.

```
ee "remotefile=C:\ProgramFiles\Merant\SLSERVER51\tracing\
SLoracle81.trc" vxml export.xml service
```

Example C: The following example exports event information for all service events starting with event number 10 in the event trace file associated with the `SLOracle` data access service to a well-formed XML file named `export.xml`.

```
e1 SLOracle rxml export.xml service count=all offset=10
```

Example D: The following example exports session event information for the `SLAgent` service to a text file named `export.txt`.

```
e1 SLAgent deltxt export.txt
```

Example E: The following example defines a query for the information it will export for the `SLOracle80` data access service to a valid XML file named `export.xml`. The query returns all SQL statements that do not return a return code of 0.

```
e1 SLOracle80 vxml export.xml stmt
query='${ReturnCode} != 0'
```

Offline configuration examples:

Example A: The following example exports event information from the local file named `SLOracle81.trc` to a text file named `export.txt`.

```
el "file=C:\ProgramFiles\Merant\SLSERVER51\tracing\  
SLOracle81.trc" deltxt export.txt
```

Example B: The following example exports event information for the first 10 events in the local file named `SLOracle81.trc` to a text file named `export.txt`.

```
el "file=C:\ProgramFiles\Merant\SLSERVER51\tracing\  
SLOracle81.trc" deltxt export.txt count=10
```

Example C: The following example exports event information from the local file named `SLOracle81.trc`, starting from the end of the file and listing all events, to a well-formed XML file named `export.xml`.

```
el "file=C:\ProgramFiles\Merant\SLSERVER51\tracing\  
SLOracle81.trc" rxml export.xml count=-all offset=end
```

Example D: The following example exports only session and service event information from the local file named `SLOracle81.trc`, starting with the fifth event, to a well-formed XML file named `export.xml`.

```
el "file=C:\ProgramFiles\Merant\SLSERVER51\tracing\  
SLOracle81.trc" rxml export.xml offset=5 service session
```

Example E: The following example exports event information for service events only from the local file named `SLOracle81.trc` to a valid XML file named `export.xml`.

```
el "file=C:\ProgramFiles\Merant\SLSERVER51\tracing\  
SLOracle81.trc" vxml export.xml service
```

Exit | e

Quits the SequeLink Manager Command-Line Tool.

Syntax {Exit | e}

Example exit

Help | ?

Displays help about the syntax for invoking the command-line tool or displays help about individual commands.

Syntax {Help | ?} [{*short_command_name* | *long_command_name*}]

where:

short_command_name is the short version of the command name. For example, e is the short version of the Echo command.

long_command_name is the long version of the command name, for example, Echo.

Example The following example displays help for the Echo command.

```
? Echo
```

MVSDDB2InterfaceAttributeAdd | mdiaa

Adds an attribute to a DB2 interface.

Syntax {MVSDDB2InterfaceAttributeAdd | mdiaa} *DB2_interface_ID*
attribute_name value

where:

DB2_interface_ID identifies the DB2 interface.

attribute_name is the attribute you want to add.

value is the value of the attribute.

Example The following example adds the MVSDDB2TraceTableSize attribute to DB2_Interface. The value is set to 128.

```
mdiaa DB2_interface MVSDDB2TraceTableSize 128
```

MVSDDB2InterfaceAttributeDelete | mdiad

Deletes an attribute for a DB2 interface.

Syntax {MVSDDB2InterfaceAttributeDelete | mdiad} *DB2_interface_ID*
attribute_name

where:

DB2_interface_ID identifies the DB2 interface from which you want to delete an attribute.

attribute_name is the name of the attribute you want to delete.

Example mdiad DB2_Interface MVSDDB2TraceTableSize

MVSDDB2InterfaceAttributeReplace | mdiar

Changes the value of a DB2 interface attribute.

Syntax {MVSDDB2InterfaceAttributeReplace | mdiar} *DB2_interface_ID*
attribute_name value

where:

DB2_interface_ID identifies the DB2 interface.

attribute_name is the name of the attribute you want to change.

value is the new value of the attribute.

Example The following example changes the value of the MVSDDB2TraceTableSize attribute to 256.

```
mdiar DB2_Interface MVSDDB2TraceTableSize 256
```

MVSDDB2InterfaceInfo | mdii

Lists all attributes and their values for a DB2 interface.

Syntax {MVSDDB2InterfaceInfo | mdii} *DB2_interface_ID*

where *DB2_interface_ID* identifies the DB2 interface for which you want to list attributes and their values.

Example

```
mdii DB2_Interface
```

MVSDB2InterfaceList | mdil

Lists all available external CICS interfaces.

Syntax {MVSDB2InterfaceList | mdil}

Example mdil

MVSGlobalAttributeAdd | mgaa

Adds an attribute to the OS/390 global settings.

Syntax {MVSGlobalAttributeAdd | mgaa} *attribute_name value*

where:

attribute_name is the name of the attribute you want to add.

value is the value of the attribute.

Example mgaa MVSTcpTrace 1

MVSGlobalAttributeDelete | mgad

Deletes an attribute in the OS/390 global settings.

Syntax {MVSGlobalAttributeDelete | mgad} *attribute_name*

where *attribute_name* is the name of the attribute you want to delete.

Example mgad MVSTcpTrace

MVSGlobalAttributeReplace | mgar

Changes the value of the specified attribute in the OS/390 global settings.

Syntax {MVSGlobalAttributeReplace | mgar} *attribute_name value*

where:

attribute_name is the name of the attribute you want to change.

value is the new value of the attribute.

Example mgar MVSTcpTrace 0

MVSGlobalInfo | mgi

Lists all attributes and their values for the OS/390 global settings.

Syntax {MVSGlobalInfo | mgi}

Example mgi

MVSUserIDMapAttributeAdd | muimaa

Adds an attribute to a user ID map.

Syntax {MVSUserIDMapAttributeAdd | muimaa} *user_ID_map attribute_name value*

where:

user_ID_map is the user ID map to which you want to add an attribute.

attribute_name is the name of the attribute you want to add.

value is the value of the attribute.

Example

The following example adds the MVSUIDDefaultAccess attribute to the UserID1 user ID map. The value is set to PERMIT.

```
miuumaa UserID1 MVSUIDDefaultAccess PERMIT
```

MVSUserIDMapAttributeDelete | muimad

Deletes an attribute for a user ID map.

Syntax

```
{MVSUserIDMapAttributeDelete | muimad} user_ID_map  
attribute_name
```

where:

user_ID_map is the user ID map from which you want to delete an attribute.

attribute_name is the name of the attribute you want to delete.

Example

```
miuumad UserID1 MVSUIDDefaultAccess
```

MVSUserIDMapAttributeReplace | muimar

Changes the value for a user ID map attribute.

Syntax

```
{MVSUserIDMapAttributeReplace | muimar} user_ID_map  
attribute_name value
```

where:

user_ID_map identifies the user ID map.

attribute_name is the name of the attribute you want to change.

value is the value of the attribute.

Example

```
miumar UserID1 MVSUIDDefaultAccess DENY
```

MVSUserIDMapInfo | muimi

Lists all attributes and their values for a user ID map.

Syntax

```
{MVSUserIDMapInfo | muimi} user_ID_map
```

where *user_ID_map* is the user ID map for which you want to list attributes and their values.

Example

```
muimi UserID1
```

MVSUserIDMapList | muiml

Lists all available user ID maps.

Syntax

```
{MVSUserIDMapList | muiml}
```

Example

```
muiml
```

NoOperation | noop

Performs no operation.

Syntax

```
{NoOperation | noop}
```

Example

```
noop
```

ProfileEventTraceCreate | petc

Creates an event trace profile for a SequeLink service.

Syntax {ProfileEventTraceCreate | petc} *service_name*

where *service_name* is the service for which you want to create the event trace profile.

Example petc SLOracle8

ProfileEventTraceDelete | petd

Deletes an event trace profile for a SequeLink service.

Syntax {ProfileEventTraceDelete | petd} *service_name*

where *service_name* is the service from which you want to delete an event trace profile. Service names can be obtained using the ServiceList | sl command.

Example petd SLOracle8

ProfileEventTraceEdit | pete

Changes an event trace profile for a SequeLink service.

Syntax {ProfileEventTraceEdit | pete} *service_name* {enable | disable | *event_group*} [{enable | disable} | {*event_name* | *event_id*} [{on | off}]] [*custom_event_filter*]

where:

service_name is the service for which to change an event trace profile. This is a requirement value. Service names can be obtained using the ServiceList | sl command.

event_group is the type of event within the service to change. Valid values are:

- {Service | srvc}
- {Session | sess}
- {Statement | stmt}
- {Transaction | trans}
- {Network | net}
- {Error | err}
- {Other | oth}

event_name is the name of the event within in the specified event group to change. You can use the ProfileEventTraceInfo command to list available event names.

event_id is the numeric identifier of the event within the specified event group to change. You can specify either *event_name* or *event_id*, not both. You can use the ProfileEventTraceInfo command to list available event identifiers.

custom_event_filter is an optional event filter that can be specified for all events being enabled. See [“Filtering Events” on page 422](#).

Examples

Example A: The following example disables all events for the SLOracle8 data access service, meaning that no events are written to the event trace file.

```
pete SLOracle8 disable
```

Example B: The following example enables the event specified by the custom event filter.

```
pete SLOracle8 enable '${ClientInfo}="127.0.0.1"'
```

Example C: The following example enables all service events for the SLOracle8 data access service.

```
pete SLOracle8 service enable
```

Example D: The following example disables all error events for the SLOracle8 data access service.

```
pete SLOracle8 err disable
```

Example E: The following example changes the state of the transaction event named Transaction Rollback to off.

```
pete SLOracle8 trans "Transaction Rollback" off
```

Example F: The following example changes the state of the session event identified by 2 to "on" if the event meets the custom event query filter.

```
pete SLOracle8 sess 2 on '${DbmsUser} = "scott"'
```

ProfileEventTraceInfo | peti

Lists event trace profile information for a SequeLink service.

Syntax

```
{ProfileEventTraceInfo | peti} service_name
```

where *service_name* is the service for which to list event trace profile information. Service names can be obtained using the ServiceList | sl command.

Example

```
peti SLOracle8
```

ProfileMonitorCreate | pmc

Creates a monitoring profile for a SequeLink service.

Syntax

```
{ProfileMonitorCreate | pmc} service_name {yes | no}
```

where *service_name* is the service for which you want to create the monitoring profile.

You must specify either yes or no. Yes indicates that shared counters will be enabled. No indicates that shared counters will not be enabled. Enabling shared counters is for Windows NT only.

Example

```
pmc SLOracle8
```

ProfileMonitorDelete | pmd

Deletes a monitoring profile for a SequeLink service.

Syntax

```
{ProfileMonitorDelete | pmd} service_name
```

where *service_name* is the service from which you want to delete the monitoring profile. Service names can be obtained using the ServiceList | sl command.

Example

```
pmd SLOracle8
```

ProfileMonitorEdit | pme

Changes a monitoring profile for a SequeLink service.

Syntax

```
{ProfileMonitorEdit | pme} service_name {enable | disable |  
event_group} [{enable | disable}] | {event_name | event_id} [{on |  
off}]
```

where:

service_name is the service for which to change the monitoring profile. Service names can be obtained using the ServiceList | sl command.

event_group is the type of event to change for the monitoring profile. Valid values are:

- {Service | srvc}
- {Session | sess}
- {Statement | stmt}

event_name is the name of the event within in the specified event group to change. You can use the ProfileMonitorInfo command to list available event names.

event_id is the numeric identifier of the event within the specified event group to change. You can specify either *event_name* or *event_id*, not both. You can use the ProfileMonitorInfo command to list available event identifiers.

Examples

Example A: The following example enables all events for the SLOracle8 data access service, meaning that all events are monitored.

```
pme SLOracle8 enable
```

Example B: The following example disables all events for the SLOracle8 data access service, meaning no events are monitored.

```
pme SLOracle8 disable
```

Example C: The following example enables all service events for the SLOracle8 data access service.

```
pme SLOracle8 service enable
```

Example D: The following example disables all session events for the SLOracle8 data access service.

```
pme SLOracle8 session disable
```

Example E: The following example changes the state of the session event named database user to off.

```
pme SLOracle8 session "database user" off
```

Example F: The following example changes the state of the session event identified by 10 to off.

```
pme SLOracle8 session 10 off
```

Example G: The following example changes the state of the statement event named sql to on.

```
pme SLOracle8 stmt sql on
```

ProfileMonitorInfo | pmi

Lists profile monitoring information for a SequeLink service.

Syntax

```
{ProfileMonitorInfo | pmi} service_name
```

where *service_name* is the service for which you want to list profile monitoring information. Service names can be obtained using the ServiceList | sl command.

Example

```
pmi SLOracle8
```

Quit | q

Quits the SequeLink Manager Command-Line Tool.

Syntax

```
{Quit | q}
```

Example

```
q
```

SaveConfig | save

Saves the current configuration. This command is available only when AutoSave setting is set to off. For more information about setting AutoSave, see the Set | s command.

Syntax {SaveConfig | save}

Example save

ServiceActiveDebugLogLevel | sadll

Displays or changes the debug log level of an active SequeLink service. When no debug log level values are provided, the current settings are listed.

Syntax {ServiceActiveDebugLogLevel | sadll} *service_name*
 [[{dis | disable}]
 [{enall | enableall}]
 [{en | enable}]
 [{ferr | fatalerror}={off | on}] |
 [{err | errors}={off | on}] |
 [{war | warnings}={off | on}] |
 [{info | informationals}={off | on}] |
 [{debug | debugging}={off | on}] |
 [{sspp | ssppackets}={off | on}] |
 [{sspr | ssprequests}={off | on}] | ...]

where *service_name* is the active service for which you want to display or change debug log levels. Service names can be obtained using the ServiceList | sl command.

Example The following example turns on debug messages and turns off error messages in the debug log for the SLOracle8 data access service.

```
sadll SLOracle8 debug=on err=off
```

ServiceActiveInfo | sai

Lists specific information about an active SequeLink service.

Syntax

```
{ServiceActiveInfo | sai} service_name
```

where *service_name* is the active service for which you want to list information. Service names can be obtained using the `ServiceList | sl` command.

Example

```
sai SLOracle8
```

ServiceAttributeAdd | saa

Adds an attribute to a SequeLink service.

Syntax

```
{ServiceAttributeAdd | saa} service_name attribute_name value
```

where:

service_name is the service to which you want to add an attribute. Service names can be obtained using the `ServiceList | sl` command.

attribute_name is the name of the attribute you want to add.

value is the value of the attribute.

For a list of SequeLink service attributes and their valid values, see [Appendix D “SequeLink Service Attributes” on page 361](#).

Example

```
saa SLOracle8 ServiceUser sqlnk
```

ServiceAttributeDelete | sad

Deletes an attribute from a SequeLink service.

Syntax {ServiceAttributeDelete | sad} *service_name attribute_name*

where:

service_name is the service from which you want to delete an attribute. Service names can be obtained using the ServiceList | sl command.

attribute_name is the name of the attribute you want to delete.

For a list of SequeLink service attributes and their valid values, see [Appendix D “SequeLink Service Attributes” on page 361](#).

Examples

```
sad SLOracle8 ServiceCodePage
```

```
sad SLOracle8 ServiceUser[2]
```

ServiceAttributeReplace | sar

Changes the value for a SequeLink service attribute.

Syntax {ServiceAttributeReplace | sar} *service_name attribute_name value*

where:

service_name is the service for which you want to change the value of an attribute. Service names can be obtained using the ServiceList | sl command.

attribute_name is the name of the attribute you want to change.

value is the new value of the attribute.

For a list of SequeLink service attributes and their valid values, see [Appendix D “SequeLink Service Attributes” on page 361](#).

Example

```
sar SLOracle8 ServiceUser[2] devuser
```

ServiceCreate | sc

NOTE: This command is not applicable to OS/390.

Creates a SequeLink service based on a service template ID.

Syntax

```
{ServiceCreate | sc} service_name service_ID tcp_port
```

where:

service_name is the name of the service to create.

service_ID identifies the ID of the service template to use to create the new service. To get a listing of available templates and their IDs, use the ServiceTemplateList command.

tcp_port is the TCP/IP port on which the service is listening.

Example

```
sc SLOracle81 SL5_Oracle8 19996
```

ServiceDebugLogLevel | sdll

Displays or changes the debug log level of a SequeLink service. When no debug log level values are provided, the current settings are listed.

Syntax

```
{ServiceDebugLogLevel | sdll} service_name  
[ [{dis | disable}]  
[ {enall | enableall}]  
[ {en | enable}]  
[ {ferr | fatalerror}={off | on}] |  
[ {err | errors}={off | on}] ]
```

```
[{war | warnings}={off | on}] |  
[{info | informationals}={off | on}] |  
[{debug | debugging}={off | on}] |  
[{sspp | ssppackets}={off | on}] |  
[{sspr | ssprequests}={off | on}] | ... ]
```

where *service_name* is the service to which the session belongs. Service names can be obtained using the ServiceList | sl command.

Example

The following example turns on debug messages and turns off error messages in the debug log file for the SLOracle8 data access service.

```
sdll SLOracle8 debug=on err=off
```

ServiceDelete | sd

NOTE: This command is not applicable to OS/390.

Deletes a SequeLink service.

Syntax

```
{ServiceDelete | sd} service_name
```

where *service_name* is the name of the service you want to delete. Service names can be obtained using the ServiceList | sl command.

Example

```
sd SLOracle8
```

ServiceInfo | si

Lists all attributes and their values for a SequeLink service.

Syntax `{ServiceInfo | si} service_name`

where *service_name* is the service for which you want to list attributes and their values. Service names can be obtained using the ServiceList | sl command.

For a list of SequeLink service attributes and their valid values, see [Appendix D “SequeLink Service Attributes” on page 361](#).

Example `si SLOracle8`

ServiceList | sl

Lists all available SequeLink services.

Syntax `{ServiceList | sl}`

Example `sl`

ServiceRegister | sr

NOTE: This command is not applicable to OS/390 or UNIX.

Registers a SequeLink service.

Syntax `{ServiceRegister | sr} service_name`

where *service_name* is the service you want to register. Service names can be obtained using the ServiceList | sl command.

Example `sr SLOracle8`

ServiceStart | ss

NOTE: This command is not applicable to OS/390.

Starts a SequeLink service.

Syntax {ServiceStart | ss} *service_name*

where *service_name* is the service you want to start. Service names can be obtained using the ServiceList | sl command.

Example ss SLOracle8

ServiceStop | sst

NOTE: This command is not applicable to OS/390.

Stops a SequeLink service.

Syntax {ServiceStop | sst} *service_name*

where *service_name* is the service you want to stop. Service names can be obtained using the ServiceList | sl command.

Example sst SLOracle8

ServiceTemplateList | stl

Lists all available SequeLink service templates and their IDs.

Syntax {ServiceTemplateList | stl}

Example stl

ServiceTemplateInfo | sti

Lists all attributes and their values for a SequeLink service template.

Syntax `{ServiceTemplateInfo | sti} service_template_ID`

where *service_template_ID* identifies the service template. To get a listing of available templates and their IDs, use the `ServiceTemplateList` command.

Example `sti SL5_Oracle81`

ServiceUnregister | su

NOTE: This command is not applicable to OS/390 or UNIX.

Unregisters the specified SequeLink service.

Syntax `{ServiceUnregister | su} service_name`

where *service_name* is the service that you want to unregister. Service names can be obtained using the `ServiceList | sl` command.

Example `su SLOracle8`

SessionDebugLogLevel | sesdll

NOTE: This command is not applicable to SequeLink services on UNIX or OS/390.

Displays or changes the debug log level of the specified session. When no debug log level values are provided, the current settings are listed.

Syntax {SessionDebugLogLevel | sesdll} *service_name*
 [[{dis | disable}]
 [{enall | enableall}]
 [{en | enable}]
 [{ferr | fatalerror}={off | on}] |
 [{err | errors}={off | on}] |
 [{war | warnings}={off | on}] |
 [{info | informationals}={off | on}] |
 [{debug | debugging}={off | on}] |
 [{spp | sppackets}={off | on}] |
 [{sspr | ssprequests}={off | on}] | ...]

where *service_name* is the service to which the session belongs. Service names can be obtained using the ServiceList | sl command.

Examples Example A: The following example displays the current settings of the debug log for session 5 of the SLOracle8 data access service.

```
sesdll SLOracle8 5
```

Example B: The following example turns on debug messages and turns off error messages in the debug log for session 5 of the SLOracle8 data access service.

```
sesdll SLOracle8 5 debug=on err=off
```

SessionInfo | sesi

Lists specific information about a session and its associated statements (only for data access sessions) for SequeLink service.

Syntax {SessionInfo | sesi} *service_name session_ID*

where:

service_name is the service to which the session belongs. Service names can be obtained using the ServiceList | sl command.

session_ID identifies the session for which you want to display information. This session must belong to the specified service. Session IDs can be obtained using the `ServiceActiveInfo | sai` command.

Example

```
sesi SLOracle8 5
```

SessionStop | sess

Stops a session for a SequeLink service.

Syntax

```
{SessionStop | sess} service_name session_ID
```

where:

service_name is the service to which the session belongs. Service names can be obtained using the `ServiceList | sl` command.

session_ID identifies the session that you want to stop. This session must belong to the specified service. Session IDs can be obtained using the `ServiceActiveInfo | sai` command.

Example

```
sess SLOracle8 5
```

Set | s

Sets the following configuration for the command-line tool settings:

`AutoSave={on | off}`. When on, the configuration is saved when a change is made. When off, the configuration is not automatically saved, and you must issue a `SaveConfig` command to save the configuration.

`Echo={on | off}`. When on, all commands entered on the command line are printed to output. When off, this setting is ignored. The default is off.

IgnoreErrors={on | off}. When on, the SequeLink Manager Command-Line Tool stops when an error occurs. This setting is useful when you want the processing of batch files to stop when an error occurs. When off, this setting is ignored. The default is off.

Syntax {Set | s} [option1={on | off} [option2={on | off} ...]]

Examples

```
set  
set echo=on  
set echo=on ignoreerrors=on
```

C Operator Interface Commands for OS/390

This appendix describes the Operator Interface commands by category:

- [“Server Controller Task \(CNTL\) Commands” on page 348](#)
- [“Messaging Component \(LOGR\) Commands” on page 351](#)
- [“TCP/IP NIM \(XTCP\) Commands” on page 353](#)
- [“DB2 Component \(DB2\) Commands” on page 356](#)
- [“XA Component \(XA\) Commands” on page 358](#)

For information about using the Operator Interface, see [“Using the SequeLink Manager for OS/390 Operator Interface” on page 118](#).

Syntax of Operator Interface Commands

The syntax for Operator Interface commands is:

compid command parms

where:

compid is the ID of the server component to which the command is directed. Valid component IDs are:

- CNTL - (Server Controller Tasks)
- LOGR - (Messaging Component)
- XTCP - (TCP/IP NIM)
- DB2 - (DB2 Component)
- XA - (XA Component)

command is the command name.

parms are the parameters of the command.

For example:

XTCP STATUS activates the TCP/IP STATUS command.

NOTE: When using the Operator Interface, you can repeat the last command you entered by pressing F24 or Shift+F12.

Server Controller Task (CNTL) Commands

ABORT

Instructs the server controller task to remove a service thread from the OS/390 server.

Parameters

USERID=*user_ID*

Removes a specific connection owned by the specified user ID.

THRDID=*thread_ID*

Removes a specific connection identified by a server thread ID.

Example

CNTL ABORT THRDID=T0000008 removes a specific connection identified by the thread ID T0000008.

ALTER

Dynamically changes the service definitions used by SequeLink Server. Use this command to alter a single value or a combination of values for a specific service.

Parameters

SERVICE=*service_name*

Identifies the service name of the SequeLink service.

TIMEOUT=*value*

Changes the idle timeout value of the specified service. The value must be a decimal in the range 0-9999.

MAXSESS=*value*

Changes the maximum number of sessions available for the service. The value must be in the range 0-9999.

AVAIL=Y | N

Indicates whether the service is available to accept connection requests. Valid values are Y (Yes) and N (No).

Examples

`CNTL ALTER SERVICE=MVSDDB25 AVAIL=N` indicates that the service MVSDDB25 cannot accept any new connection requests.

`CNTL ALTER SERVICE=MVSDDB25 AVAIL=Y MAXSESS=250` indicates that the service MVSDDB25 can now accept new connection requests and sets the maximum number of sessions to 250.

HALT

Shuts down the SequeLink Server system.

Parameters

None

Example

`CNTL HALT` shuts down the SequeLink Server immediately.

STATUS

Displays the general status of the SequeLink Server system.

Parameters

SHOW=ALL

Lists all active tasks (server core tasks and service tasks) and shows their status. All services known to the server are listed.

SHOW=SERVICES

Lists all active application service tasks known to the server.

NOTE: The SHOW parameter is optional.

Example

CNTL STATUS displays the status of each attached component. The output displays on the operator's console.

CNTL STATUS SHOW=ALL displays all known active tasks and services. The output displays on the operator's console.

CNTL STATUS SHOW=SERVICES lists all active services. The output displays on the operator's console.

Messaging Component (LOGR) Commands

ALTER

Starts or stops logging of trace messages.

Parameter

TRACE=ON | OFF

Turns on or off logging of trace messages sent by components.

COMPNT=ALL | *component_ID*

Specifies which components will have messages logged. This can be set to ALL (messages from all system components) or to a component ID (messages for that component only). Valid component IDs include:

C - Common or shared components (operator interface, for example)

D - DB2 component

L - Generic log component

M - Monitor component

S - Server controller component

X - TCP/IP component

Examples

LOGR ALTER TRACE=ON COMPNT=ALL sets tracing on for all components.

LOGR ALTER TRACE=OFF COMPNT=M sets tracing off for the monitor component.

LOGR ALTER TRACE=OFF COMPNT=ALL sets tracing off for all components.

PRINT

Prints a SequeLink Server system log.

Parameters

LOG=*log_name*

Prints the primary log, VAILOGP, or the secondary log, VAILOGS. The default is the inactive log.

CLASS=*class_name*

Indicates which SYSOUT class to which to spool the printout. The default is A.

HOLD=Y | N

Indicates whether the output is to be held on the output queue. Valid values are Y (Yes) or N (No). The default is N.

NOTE: All parameters are optional.

Example

LOGR PRINT CLASS=L spools the inactive log to the JES2 output class L; the output is not held in the output queue.

STATUS

Displays the status of the message logging component (LOGR).

Parameters

None

Example

LOGR STATUS returns a single line, providing the general status of the logging component.

SWITCH

Changes the active log. This command switches to the alternate log, making the current log available for printing or archiving.

Parameters None

Example LOGR SWITCH changes the active log. For example, if the primary log (VAILOGP) is active when this command is issued, the secondary log (VAILOGS) becomes the active log. Issuing the command again makes VAILOGP the active log again.

TCP/IP NIM (XTCP) Commands

CLOSE

Closes a TCP/IP connection.

Parameters NAME=*task_name*

Closes the TCP/IP connection associated with the specified task name.

NAME=ALL

Closes all TCP/IP connections for the server.

Examples XTCP CLOSE NAME=T0000002 closes the TCP/IP connection identified by T0000002.

XTCP CLOSE NAME=ALL closes all TCP/IP connections.

DISPLAY

Displays the connection status of one or all subtasks.

Parameters `NAME=task_name`

Displays the connection status of a specific subtask identified by the task name assigned to it.

`NAME=ALL`

Displays the connection status of all subtasks.

Examples `XTCP DISPLAY NAME=T0000002` displays the status of the connection identified by T0000002.

`XTCP DISPLAY NAME=ALL` displays the status of all connections between the server and its clients.

SHOW

Displays the connection status of one or all subtasks.

Parameters: `NAME=task_name`

Displays the connection status of a specific subtask identified by the task name assigned to it.

`NAME=ALL`

Displays the connection status of all subtasks.

Examples `XTCP SHOW NAME=T0000002` displays the status of the connection identified by T0000002.

`XTCP SHOW NAME=ALL` displays the status of all connections between the server and its clients.

STATE

Displays the general service state of the NIM and lists the services (with port number and socket number) the NIM is listening on for connection requests.

Parameters None

Example `XTCP STATE` displays the service state of the NIM.

STATUS

Displays the general status of the NIM and a list of all active connections.

Parameters None

Examples `XTCP STATUS` displays the status of the NIM and lists all active TCP/IP connections.

TRACE

Turns tracing facility on and off, and checks whether tracing is turned on or off.

Parameters SET=on | off

Turns on and off tracing.

SET=?

Indicates whether tracing is turned on or off.

NOTE: The SET parameter is required.

Examples

XTCP TRACE SET=on turns on tracing.

XTCP TRACE SET=off turns off tracing.

XTCP TRACE SET=? returns a status, indicating whether tracing facility is turned on or off.

DB2 Component (DB2) Commands

SHOW

Shows all active DB2 interfaces.

Parameters None

Example DB2 SHOW shows all active DB2 interfaces.

STATUS

Displays the status of SequeLink Server DB2 sessions.

Parameters ID=*ifid*

Identifies the DB2 session of which you want to display the status.

Example DB2 STATUS ID=DSN5 displays the status of all SequeLink Server DB2 sessions for DB2 interface DSN5.

CONNECT

Explicitly connects a DB2 interface to the DB2 address space.

Parameter

ID=ifid

Identifies the DB2 interface that will be used to connect to the address space.

Example

DB2 `CONNECT ID=DSN5` connects the DB2 interface DSN5 to the SequeLink address space.

DISCONN

Explicitly disconnects a DB2 interface from the DB2 address space. This command does not allow any new connections to the DB2 interface.

Parameter

ID=ifid

Identifies the DB2 interface that will be used to disconnect from the address space.

Example

DB2 `DISCONN ID=DSN5` disconnects the DB2 interface DSN5 from the SequeLink address space.

XA Component (XA) Commands

LIST

Lists all XA transactions and associated RRS contexts in the SequeLink Server.

Parameter None

Example `LIST` lists all XA transactions and associated RRS contexts in the SequeLink Server.

RELEASE

Performs cleanup of XA transactions and associated RRS contexts in the SequeLink Server by releasing contexts without an owner task that may still hold locks on DB2 resources. The transactions can be rolled back or committed to release the locks in the data store held by these contexts.

Parameters `ID=ifid`

Identifies the DB2 interface that will be used to release the context.

NOTE: This parameter is required.

`THRDID=thread_ID`

Identifies the thread ID that holds the resources in the data store.

NOTE: This parameter is required.

TYPE=ROLLBACK | COMMIT

Rolls back or commits the specified transaction. The default is ROLLBACK.

Example

`RELEASE THRDID=T0000003 TYPE=ROLLBACK` rolls back the specified transaction. The RSS context used the last time by T0000003 will end and all resources held in the data store by the context will be rolled back.

D SequeLink Service Attributes

This appendix lists the SequeLink service attributes you can set to configure and manage your SequeLink services using the SequeLink Manager tools. For each attribute, the following information is listed:

- Valid values for the attribute
- A description of the attribute
- A default value (when an attribute has a default)
- Whether the attribute is a static or dynamic attribute

NOTES:

- Attributes beginning with the string "DataSource" are SequeLink data access service attributes that are associated with a server data source.
- *Static attributes* require you to restart a SequeLink service when you add or change the attribute before the change becomes effective. *Dynamic attributes* become effective after the attribute is added or changed and the configuration is saved. Most dynamic attributes affect the behavior of a database connection; therefore, when you add or change an attribute, the new values are used for the next connection, active connections do not use the new values.

NOTE: Server data source attributes are always dynamic.

- The meaning of the default value depends on your SequeLink Server platform.
 - On Windows NT and UNIX, this default value is the value used when it is not overridden during the installation of the SequeLink Server. Some default values are changed when the service is created during the installation process. For example, this appendix states that the

default value of the ServiceEventTraceLocation attribute is empty string; however, after the installation of the SequeLink Server, the default value is a directory beneath the installation directory.

- On OS/390, the default values are the installation defaults.
- When working with the SequeLink Manager for OS/390, you can access online help for each field by positioning your cursor on the field and pressing F1. The online help will indicate if the field maps to a SequeLink service attribute.

SequeLink Service Attributes

This section lists SequeLink service attributes in alphabetical order.

DataSourceApplID

Specifies a list of application IDs the SequeLink data access service will accept. A valid application ID is an alphanumeric string with a maximum length of 128 characters.

The default is an empty string.

For more information about using application IDs to limit access to SequeLink services, see [Chapter 12 "Configuring SequeLink Security" on page 241](#).

Type=Dynamic

DataSourceArrayFetchMaxBytes

Specifies the buffer size to be used when fetching an array. Valid values are from 0 to 67018864.

The default is 65536.

NOTE: On OS/390, the only valid value and the default is 1.

Type=Dynamic

DataSourceAutoAppId

Specifies a list of automatically generated application IDs the SequeLink data access service will accept. A valid automatically generated application ID contains exactly 40 hexadecimal digits.

The default is an empty string.

For more information about using application IDs to limit access to SequeLink services, see [Chapter 12 "Configuring SequeLink Security" on page 241](#).

Type=Dynamic

DataSourceBlockFetchForUpdate

When the isolation level is Read Committed and a SELECT FOR UPDATE statement is issued against some data stores, the SequeLink Client does not lock the expected row. To lock the appropriate row, set this attribute to 0.

NOTE: Specifying 0 will degrade the performance for SELECT FOR UPDATE statements because rows will be fetched one at a time.

The default is 1.

Type=Dynamic

DataSourceCurrentCatalog

Specifies the default catalog to be used when connected to the SequeLink data access service. The valid value is a defined database catalog name.

The default is an empty string.

Type=Dynamic

DataSourceCursorHold

Specifies whether cursors are opened with the HOLD attribute. Valid values are:

- FALSE=Not opened
- TRUE=Opened

The default is FALSE.

Type=Dynamic

DataSourceDB2CatalogOwner

Specifies the owner of the DB2 catalog. This parameter allows you to limit the meta-information that is returned by using views on the DB2 catalog.

Specify `SYSIBM` when making selections on the native DB2 catalog tables. Otherwise, specify a different value for the catalog owner to limit the number of tables retrieved by SequeLink. The valid value is a defined database catalog name.

The default is SYSIBM.

Type=Dynamic

DataSourceDB2CollectionPrefix

Specifies a user-defined prefix, which can be no longer than 15 characters, for the DB2 collection that identifies where the SequeLink package resides.

Based on the isolation level (`DataSourceTransactionIsolation` attribute), a suffix is added to the DB2 collection name. Possible values are:

- Read Uncommitted: *CollectionPrefix_U*
- Read Committed: *CollectionPrefix_S*
- Repeatable Read: *CollectionPrefix_T*
- Serializable: *CollectionPrefix_R*

For example, if you used the default prefix SWDB2 for an uncommitted connection, the DB2 collection name would be SWDB2_U.

The default is SWDB2.

Type=Dynamic

DataSourceDB2DBFilterList

Specifies a list of comma-separated values specifying the databases from which tables can be retrieved by a `SQLTables` call. You cannot use quotes.

The default is an empty string.

Type=Dynamic

DataSourceDB2MaxLobSize

Specifies the size (in bytes) that is reported for BLOB and CLOB data types, for example, in response to a SQLGetTypeInfo call (ODBC) or the equivalent OLE DB and JDBC calls.

NOTE: This attribute only applies to DB2 V6 and higher.

Valid values are from 1 to 2147483647.

The default is 2147483647.

Type=Dynamic

DataSourceDB2ReportLobsFirst

Specifies the order which BLOB and CLOB data types are reported in, for example, in response to a SQLGetTypeInfo call (ODBC) or the equivalent OLE DB and JDBC calls.

- FALSE=Report LONG VARCHAR and LONG VARCHAR FOR BIT DATA data types before CLOB and BLOB data types.
- TRUE=Report CLOB and BLOB data types before LONG VARCHAR and LONG VARCHAR FOR BIT DATA data types.

The default is FALSE.

Type=Dynamic

DataSourceDescription

Specifies a general description of the server data source.

Type=Static

DataSourceDisableWarnings

Turns on and off the filtering of generated warnings.

- TRUE=Turns on filtering
- FALSE=Turns off filtering

Type=Dynamic

DataSourceFetchNextOnly

Turns on a workaround for Visual Basic/Remote Data Objects (RDO) that circumvents a problem with FORWARD_ONLY cursors when the driver reports other values than FETCH_NEXT for SQLGetInfo(SQL_FETCH_DIRECTION).

For example, if the driver only reports FETCH_NEXT, RDO performs SQLExecDirect, SQLBindCol, and SQLExtendedFetch(NEXT). If the driver supports more than FETCH_NEXT, RDO performs SQLExecDirect, SQLExtendedFetch(NEXT), and SQLGetData. This is only valid when the rowsize is 1, but RDO uses a larger rowsize in this situation.

- TRUE=The driver will incorrectly report that only SQL_FETCH_NEXT is supported, which satisfies RDO.
- FALSE=The workaround is not turned on.

The default is FALSE.

Type=Dynamic

DataSourceFetchTimeStampAsString

Specifies whether a workaround for a Microsoft Access problem with timestamps is turned on.

- TRUE=Yes
- FALSE=No

The default is FALSE.

Type=Dynamic

DataSourceFixCharTrim

Turns on a workaround for applications that have a problem using SQL_CHAR data padded with spaces. The SequeLink ODBC Driver returns SQL_CHAR data padded with spaces as mandated by the ODBC specification.

- 0=The workaround is not turned on.
- 1=Returns SQL_CHAR data that is not padded with spaces.

The default is 0.

Type=Dynamic

DataSourceINFClientLocale

Sets the Informix CLIENT LOCALE environment variable used by the SequeLink service.

Type=Dynamic

DataSourceINFDbLang

Sets the Informix DBLANG environment variable used by the SequeLink service.

Type=Dynamic

DataSourceINFDbLocale

Sets the Informix DBLOCALE environment variable used by the SequeLink service.

Type=Dynamic

DataSourceINFDbNls

Sets the Informix DBANSIWARN environment variable used by the SequeLink service.

Type=Dynamic

DataSourceINFDelimIdent

Sets the Informix DELIMIDENT environment variable used by the SequeLink service.

Type=Dynamic

DataSourceINFHost

Sets the Informix INFORMIXHOST environment variable used by the SequeLink service.

Type=Dynamic

DataSourceINFormixDir

Sets the Informix INFORMIXDIR environment variable used by the SequeLink service.

Type=Dynamic

DataSourceINFormixServer

Sets the Informix INFORMIXSERVER environment variable used by the SequeLink service.

Type=Dynamic

DataSourceINFLang

Sets the Informix LANG environment variable used by the SequeLink service.

Type=Dynamic

DataSourceINFService

Sets the value of the Informix SERVICE network parameter used by the SequeLink service.

Type=Dynamic

DataSourceLogonMethod

Specifies the data store logon method to be used to log on the data store. Valid values are:

- DBMSLogon(DBUID,DBPWD)
- DBMSLogon(UID,PWD)
- OSIntegrated

For more information about configuring SequeLink security, see [Chapter 12 "Configuring SequeLink Security" on page 241](#).

Type=Dynamic

DataSourceMSSBindAllLOBs

Specifies which columns will be buffered. Valid values are:

- TRUE= the SequeLink Server will buffer ALL columns in the result set.
- FALSE= the SequeLink Server for Microsoft SQL Server does not buffer large object columns that are at the end of a result set. Instead, it uses SQLGetData to get the CLOB/BLOB data as it is requested by the client, which saves memory on the server.

The default is FALSE.

Type=Dynamic

DataSourceMSSCursorType

Specifies the type of cursor the SequeLink server will use. Valid values are:

- Serverside=Allows multiple concurrent statements (and cursors) to be active at the same time for each connection.

- **Serverside-Preserve**=Server-side cursors that stay open and positioned when a transaction is committed.
- **Clientside**=Allows only one active statement/cursor for each connection.

The default is Serverside.

Type=Dynamic

DataSourceMSSCursorWarnings

Microsoft SQL Server sometimes has problems opening server-side cursors for some select or stored procedure result sets. This setting masks the warning issued by Microsoft SQL Server each time it encounters this problem. Valid values are:

- **True**= The warning is not masked from the client application.
- **False**= The warning is masked from the client application.

The default is False.

Type=Dynamic

DataSourceMSSODBCConnStr

Specifies the connection string to be used when the SequeLink Server connects to an ODBC data source. The valid values for UID, PWD, and DB are provided by the client application and are appended to the connection string.

The default is an empty string.

Type=Dynamic

DataSourceMSSODBCLogPath

Specifies the log path to be used for all ODBC calls executed by the SequeLink data access service. The valid value is a defined path for a log file.

Type=Dynamic

DataSourceName

Specifies the name of the server data source.

Type=Dynamic

DataSourceORAPublicSchemaSupp

Determines whether the Oracle schema named PUBLIC is supported in catalog statements (for example, SQLTables).

- TRUE= Turns on support
- FALSE= Turns off support

Type=Dynamic

DataSourceORAServiceName

Specifies the Oracle service name to which the application wants to connect. The valid value is a defined Oracle service name.

Type=Dynamic

DataSourceORASynDBLinkObjSupp

Turns on and off support for synonyms of remote Oracle objects in Catalog statements. Valid values are:

- TRUE= Turns on support
- FALSE= Turns off support

The default is FALSE.

Type=Dynamic

DataSourceReadOnly

Controls read-only access to the SequeLink data access service. Valid values are:

- No= All statements are allowed.
- Select= Only Select statements are allowed.
- Select and batches= Select statements and implicit batches are allowed.
- DBMS= The read-only capabilities of the database are used.

The default is No.

Type=Dynamic

DataSourceSchemaFilterList

A schema name filter for SQLTables. Valid values are any defined schemas including:

- *list_of_schema_names*=A comma-separated list of schemas. Only tables owned by the listed schemas are included in the result set. You can use the % or _ character as a search pattern. You cannot use quotes.

- CURRENT SCHEMA=Only tables owned by the current user are returned.

The default is an empty string.

Type=Dynamic

DataSourceSLKStcCrsrLngCLBuff

Specifies the amount of data (in KB) that is buffered for SQL_LONGVARCHAR and SQL_LONGVARBINARY columns with a static cursor.

The default is 4.

Type=Dynamic

DataSourceTableTypeFilterList

Specifies a table-type filter for SQLTables.

- On Windows NT and UNIX: The valid value is the name of a table-type filter list for SQL tables.
- On OS/390: The valid value is a comma-separated list of table types. Valid table types on this platform include:

TABLE
VIEW
SYSTEM TABLE
ALIAS
SYNONYM
GLOBAL

The default is an empty string.

Type=Dynamic

DataSourceThreadMaxRpc

Specifies the number of connection requests that will be accepted before the thread allocated to the connection is released to the thread pool. Valid values are between 0 and 1000.

If 0 is specified, the thread is only released when the connection terminates.

The default is 10.

Type=Dynamic

DataSourceThreadRpcTimeOut

Specifies the idle time (in milliseconds) for threads allocated to connections. Once this value is reached, the thread allocated to the connection is released to the thread pool. Valid values are between 0 and 1000000.

Specify 0 to disable the timeout mechanism.

The default is 2000.

Type=Dynamic

DataSourceTransactionIsolation

Specifies the transaction isolation level used for the connection. Valid values are:

- Not supported=Transaction isolation levels are not supported for connections
- Uncommitted
- Committed
- RepeatableRead
- Serializable

Refer to your database documentation for a definition of each isolation level.

The default is Not supported.

Type=Dynamic

DataSourceWorkArounds

Turns on workarounds that allow you to take full advantage of the SequeLink ODBC Driver with ODBC applications requiring nonstandard or extended behavior.

IMPORTANT: Each of these options has potential side effects related to its use. An option should only be used to address the specific problem for which it was designed.

- 1= If an ODBC driver reports to Microsoft Access 2.0 that its `SQL_CURSOR_COMMIT_BEHAVIOR` or `SQL_CURSOR_ROLLBACK_BEHAVIOR` is 0, Microsoft Access opens tables as read-only. If this option is on, the ODBC driver returns 1, allowing Microsoft Access to open tables as read-write.
- 2=Some applications cannot handle database qualifiers. If this option is on, the driver reports that qualifiers are not supported.
- 4=Visual Basic 4.0 sometimes requires two connections to a DBMS. For DBMSs that support only a single connection, the second attempt fails. If this option is on, the driver detects when this condition occurs and has the two ODBC connections share a single physical connection to the DBMS.
- 8=If an ODBC driver cannot detect the number of rows effected by an Insert, Update, or Delete statement, it may return -1 in `SQLRowCount`. Some products cannot handle this. Turning this option on causes the driver to return 1 instead.

- 16=If an ODBC driver in SQLStatistics reports to Microsoft Access 1.1 that an INDEX_QUALIFIER contains a period, Microsoft Access returns a tablename is not a valid name error. If this option is on, the driver returns no INDEX_QUALIFIER, allowing Microsoft Access to open the table.
- 32=This option allows users of flat-file drivers to abort a long-running query by pressing the ESC key.
- 64=This option results in a column name of Cposition where position is the ordinal position in the result set. For example:


```
SELECT col1, col2+col3 FROM table1
```

 - produces the column names col1 and C2. SQLColAttributes/SQL_COLUMN_NAME returns an empty string for result columns that are expressions. Use this option for applications that cannot handle empty strings in column names.
- 256=Forces SQLGetInfo/SQL_ACTIVE_CONNECTIONS to be returned as 1.
- 512=To prevent ROWID results, this option forces the SQLSpecialColumns function to return a unique index as returned from SQLStatistics.
- 2048=This option results in SQLDriverConnect returning "Database=" instead of "DB=" in the returned connection string.
- 65536=This option strips trailing zeros from decimal results, which prevents Microsoft Access from generating an error when decimal columns containing trailing zeros are included in the unique index.
- 131072=This option turns all occurrences of the double quote character (") into the accent grave character (`). Some applications always quote identifiers with double quotes. Double quoting causes problems for data sources that do not return SQLGetInfo/SQL_IDENTIFIER_QUOTE_CHAR = ".

- 524288=This option overrides the precision and scale settings for SQL_DECIMAL parameters to precision 40 and scale 20.
- 8388608=This option causes SQLGetInfo/SQL_DATABASE_NAME to be returned as an empty string when SQLGetInfo/SQL_MAX_QUALIFIER_NAME_LEN is 0. This option should be used with Inprise/Borland tools, such as Delphi.
- 536870912=This option allows SQLBindParameter to be called after SQLExecute to change the precision of previously bound parameters.
- 1073741824=Microsoft Access assumes that ORDER BY columns do not have to be in the SELECT list. This option provides a workaround for data stores that always use ORDER BY columns.

Type=Dynamic

DataSourceWorkarounds2

Turns on workarounds that allow you to take full advantage of the SequeLink ODBC Driver with ODBC applications requiring nonstandard or extended behavior.

IMPORTANT: Each of these options has potential side effects related to its use. An option should only be used to address the specific problem for which it was designed.

- 2=Some applications incorrectly specify the ColumnSize/DecimalDigits when binding timestamp parameters. This option causes the driver to ignore the ColumnSize/DecimalDigits specified by the application and use the database defaults instead.
- 4=Microsoft Access uses the most recent native type mapping, as returned by SQLGetTypeInfo, for a specific SQL

type. This option reverses the order in which types are returned, so that Microsoft Access will use the most appropriate native type. This option is recommended if you are using Microsoft Access against an Oracle8 data store.

- 32=Microsoft Access does require that the characters "DSN=" are returned by SQLDriverConnect in the connection string output parameter.

Type=Dynamic

MVSDDataSourceDB2Plan

Specifies the DB2 plan name for the server data source. The valid value is a defined DB2 plan name.

The default is SWDB2PL.

Type=Dynamic

MVSDDB2ExitLibrary

Specifies the name of the fully qualified DB2 exit-library (without quotes) for this DB2 interface used to generate JCL. Valid values are OS/390 data set names.

Type=Static

MVSDDB2LoadLibrary

Specifies the name of the fully qualified DB2 load-library (without quotes) for this DB2 interface used to generate JCL. Valid values are OS/390 data set names.

Type=Static

MVSDB2RootDescription

Specifies a general description of the DB2 interface. The valid value is a defined DB2 interface.

Type=Static

MVSDB2SubsystemName

Specifies the subsystem ID of the DB2 address space. The valid value is a defined interface ID.

The default is MVSDB2InterfaceID.

Type=Static

MVSDB2Version

Specifies the DB2 version of the DB2 interface. Valid values are:

- V410
- V510
- V610

Type=Static

MVSGlobalCommandChar

Specifies the subsystem ID command recognition character that allows you to use the OS/390 modify command to issue SequeLink Operator Interface commands.

To use the subsystem ID command recognition character, the MVSGlobalSubSysID attribute must be defined.

If unspecified, SequeLink will run normally, a subsystem ID will not be used, and Operator Interface commands cannot be issued with a command character. The valid value is a defined command character.

Type=Static

MVSGlobalCompTrace

Turns on and off tracing for server core components. Valid values are ALL or one of the following component_IDs:

C - Core components
D - DB2 component
E - EXCI component
L - Generic Log component
M - Monitor component
S - Server controller component
X- TCP/IP component

If unspecified, no tracing will be performed.

The default is no component trace.

Type=Static

MVSGlobalDB2Attachment

Specifies the type of DB2 attachment to be used.

MVSGlobalDB2Attachment=RRSAF can only be used with DB2 V5R1 or higher. In addition, RRS must be active. Valid values are:

- CAF
- RRSAF

The default is CAF.

NOTE: RRSAF is required for distributed transactions.

Type=Static

MVSGlobalDescCode

Specifies the WTO descriptor code for all messages directed to a console by the message logging task. The valid value is a defined WTO descriptor code.

The default is 06.

Type=Static

MVSGlobalRouteCode

Specifies the WTO route code for all messages directed to a console by the message logging task. The valid value is a defined WTO route code.

The default is 11.

Type=Static

MVSGlobalSMFRecordType

Specifies the System Management Facility (SMF) record type to be used for SMF records produced by the server. Valid values are between 128 and 255.

If 0, SMF recording is turned off.

If unspecified, no SMF records are produced.

If you set this value to a positive number, you must inform the system of these records by changing the OS/390 SMF parameters

in the SMFPRMxx member of the SYS1.PARMLIB data set. You can activate the collection of these records using the SET command.

The recommended value is 197.

Type=Static

MVSGlobalSosLimit

Specifies the global short-on-storage (SOS) limit, which is the total amount of private storage (in KB) that must be available in the address space to accept further connections. If this amount of storage is unavailable, the incoming connections will be rejected. To turn this feature off, specify 0 or delete this attribute. Valid values are between 0 and 2048.

The default is 1024.

Type=Static

MVSGlobalSosLimitBtl

Specifies the amount of private storage (in KB) below the 16 MB line that must be available in the server address space to accept further connections. If this amount of storage is unavailable, incoming connection requests will be rejected.

Valid values are between 0 and 2048. If 0 or not specified, this attribute is ignored.

The default is 64 (K).

NOTE: Only set this attribute when instructed to do so by MERANT technical support.

Type=Static

MVSGlobalSubSysID

Specifies a unique OS/390 subsystem ID for SequeLink Server that is used to register the SequeLink service to RRS. You can view the OS/390 Subsystem Name table (IEFSSNxx member of SYS1.PARMLIB) to make sure that the subsystem ID is not already defined. The valid value is a unique subsystem ID.

Type=Static

MVSGlobalSwap

Specifies whether the server address space is swappable. Valid values are:

- TRUE=Makes the server address space swappable.
- FALSE=Makes the server address space unswappable.

The default is FALSE.

Type=Static

MVSGlobalTimerInterval

Specifies the server heartbeat interval (in seconds). A time-driven task posts the server's tasks when the specified time interval has elapsed and alerts the SequeLink Server about possible stalled tasks. Valid values are greater than 0.

The default is 15.

Type=Static

MVSICSLinkLibrary

Specifies the name of the SASLNK-library for the INTERLINK TCPAccess stack in use. Valid values are OS/390 data set names fully qualified without quotes. The library must contain TCPAccess 5.2 with 9907 Cum Tape.

Type=Static

MVSICSSubsysID

Specifies the OS/390 subsystem ID assigned to the INTERLINK TCPAccess Subsystem.

The default is ACSS.

Type=Static

MVSLaunch

Specifies whether the DB2 interface is automatically started at initialization. Valid values are:

- TRUE=Automatically starts the DB2 interface at initialization.
- FALSE=Does not automatically start the DB2 interface at initialization.

The default is TRUE.

Type=Static

MVSServiceAbendExit

Invokes an exit routine when the service abnormally terminates. An ABENDEXIT can be used to format critical control block

structures for debugging. The exit must exist in the JOBLIB/STEPLIB data sets or in the LNKST concatenation. If both ABENDEXIT and EOTEXIT are specified, ABENDEXIT receives control before EOTEXIT. If omitted, no abend exit routine is invoked. Valid values are uppercase.

The default is VAICDB2J.

Type=Static

MVSServiceAdminSecurity

Specifies the security type for the agent service. Valid values are:

- SAFNONE=no validation of the client's user ID and password.
- SAFBASIC= validates the client's user ID and password.
- SAFRESOURCE= validates the client's user ID and password, and its authority to access the service in administration mode. If specified, the resource name specified in MVSServiceAdminSecurityResource must be defined in the security system's general resource class profile. The default resource class name is FACILITY. It can be overridden with the MVSSecurityAdminSecurityClass parameter, if the resource class name is defined in your security system.

The default is SAFBASIC.

Type=Dynamic

MVSServiceAdminSecurityClass

Specifies a general resource class name to be used by the server.

The default is FACILITY.

Type=Dynamic

MVSServiceAdminSecurityResource

Validates a connection request against the OS/390 security system when MVSServiceAdminSecurity=SAFRESOURCE. If the attribute is not specified, the server uses the service name of the SequeLink service as the resource name to be checked.

The default is the service name.

Type=Dynamic

MVSServiceCodePageNr

Used when ServiceCodePage=OS and the EBCDIC-coded character set in the DB2 installation is 0 (no CCSID is used). Valid values are between 1 and 65533.

The default is 37.

Type=Dynamic

MVSServiceDataClass

Specifies the data class of the debug log file. If you do not use this class, delete this attribute.

The default is an empty string.

Type=Static

MVSServiceDB2InterfaceID

Specifies the ID of a DB2 interface. A DB2 interface is a set of parameters that describe a DB2 subsystem which can be accessed by the SequeLink Server for OS/390.

Type=Static

MVSServiceIdleAction

Specifies an action to be taken by the SequeLink Server when a stalled SequeLink service is detected. This attribute only applies when the MVSServiceIdleTime attribute has a non-zero value. Valid values are:

- ABORT=Terminates the service immediately.
- MESSAGE=Posts a message (VAIS163W) to the server log file and to the operator console, and allows the SequeLink service to continue running.
- IGNORE=Bypasses the facility to detect stalled conditions (same as MVSServiceIdleTime=0).

The default is MESSAGE.

Type=Static

MVSServiceIdleTime

Specifies the maximum time, in seconds, the SequeLink service can be idle before the action determined by the MVSServiceIdleAction attribute is taken. If unspecified or MVSServiceIdleTime=0, stalled services will not be detected.

The default is 0.

Type=Static

MVSServiceLoadModule

Specifies the name of the load module for the service. Valid values are uppercase.

The default is VAICDB2S (for SequeLink Server for DB2 services) and VAIAGCON (for SequeLink Agent services).

Type=Static

MVSServiceMaxCPUTime

Specifies the total amount of CPU time (in seconds) that the service is allowed to consume. If unspecified or MVSServiceMaxCPUtime=0, the service is not monitored for total CPU time usage.

The default is 0.

Type=Static

MVSServiceMgmtClass

Specifies the management class of the debug log file. The valid value is a defined management class.

The default is an empty string.

Type=Dynamic

MVSServiceRatActionMaxCPU

Specifies the action to be taken if the total CPU time used by the service exceeds the value set by the MVSServiceMaxCPUTime attribute. Valid values are:

- LOG=A warning message is posted in the SequeLink Server log when the CPU time is exceeded, and the service continues to run.
- DIE=A warning message is posted in the SequeLink for OS/390 log when CPU time is exceeded, and the service is terminated.
- MSG=A warning message is posted in the SequeLink for OS/390 log when total CPU time is exceeded, and the service continues to run. Monitoring is discontinued for this thread.

If MVSServiceMaxCPUTime=0, this attribute is ignored.

The default is LOG.

Type=Static

MVSServiceRatActionThrottle

Specifies the action to be taken if the throttle has been exceeded during a timer cycle. Valid values are:

- LOG=A warning message is posted in the SequeLink for OS/390 log when the CPU time is exceeded, and the service continues to run.
- DIE=A warning message is posted in the SequeLink for OS/390 log when CPU time is exceeded, and the service is terminated.

If MVSServiceMaxCPUTime=0, this attribute is ignored.

The default is DIE.

Type=Static

MVSServiceSecurity

Specifies the type of security used by the service. Valid values are:

- SAFNONE=Allows anonymous access to a service. The user ID (UID) map used by the service (see the attribute “MVSUID” on [page 397](#)) must contain an entry in the format:

**=mapped_user*

where *** is a wildcard for any user and *mapped_user* is a valid DB2 authorization ID.

- SAFBASIC=Validates the client’s user ID and password. If successful, access to the SequeLink service is allowed.
- SAFRESOURCE=Validates the client’s user ID and password, and its authority to access a service by verifying that the user has access to a resource defined in a specific resource class. The default resource class name is FACILITY, and the default resource name is the name of the service. The resource class name to be used can be overridden by specifying the MVSServiceSecurityClass attribute. The resource name to be used can be overridden by specifying the MVSServiceSecurityResource attribute.

The default is SAFBASIC.

For more information about configuring SequeLink security, see [Chapter 12 “Configuring SequeLink Security” on page 241](#).

Type=Dynamic

MVSServiceSecurityClass

Specifies a general resource class name used by the SequeLink Server when MVSServiceSecurity=SAFRESOURCE.

The default is FACILITY.

Type=Dynamic

MVSServiceSecurityResource

If this attribute is set to SAFRESOURCE, the resource name is used to validate a connection request against the OS/390 security system. If the attribute's value is blank or an empty string, the server uses the service name as the resource name to be checked.

The default is the service name.

Type=Dynamic

MVSServiceStorClass

Specifies the storage class of the debug log file. If you do not use this class, delete this attribute. The valid value is a defined storage class.

The default is an empty string.

Type=Dynamic

MVSServiceThrottle

Specifies the maximum amount of CPU time (in seconds) that the SequeLink service is allowed to consume during a SequeLink for OS/390 timer cycle (MVSGlobalTimerInterval attribute). If unspecified or 0, the service is not monitored.

The default is 0.

Type=Static

MVSServiceUIDMap

Specifies the name of a user ID (UID) map. The valid value is a defined UIDMap name.

The default is an empty string.

Type=Dynamic

MVSServiceUnit

Specifies a description of the unit to which the debug log file is allocated. This attribute is ignored when MVSServiceMgmtClass is specified. The valid value is a defined description of the service unit.

The default is an empty string.

Type=Dynamic

MVSServiceVol

Specifies the serial number of the volume to which the debug log file is allocated. This attribute is ignored when MVSServiceMgmtClass is specified. The valid value is a defined serial number.

The default is an empty string.

Type=Dynamic

MVSTcpDebug

Turns on and off debugging mode for the NIM. Specify this attribute only when requested to do so by MERANT technical support. Valid values are:

- 0=Turns off debugging
- 1=Turns on debugging

The default is 0.

Type=Static

MVSTcpEtcServices

Specifies the data set name of ETC.SERVICES. SequeLink uses the hlq.ETC.SERVICES data set to determine the port number on which the SequeLink service will run if the service does not specify a port.

Type=Static

MVSTcpJobName

Specifies the name of the started procedure used to start the TCP/IP address space. You can find the value in the hlq.TCPIP.DATA data set as the value of TCPIPJOBNAME. The valid value is a defined procedure name.

The default is TCPIP.

Type=Static

MVSTcpMaxSessions

Specifies the maximum number of concurrent connection requests that the listener can handle. Once this value is reached, the listener will not accept any more connection requests. Valid values are between 8 and 2048.

The default is 128.

Type=Static

MVSTcpTrace

Turns on and off tracing for the listener. Specify this attribute only when requested to do so by MERANT technical support. Valid values are:

- 0=Turns off tracing
- 1=Turns on tracing

The default is 0.

Type=Static

MVSUID

Specifies an entry in the user ID (UID) map. The format of this entry is: *user=mapped_user* or **=mapped_user*, where:

- *user* is a valid user or user group for the OS/390 security system
- *** is a wildcard for any user
- *mapped_user* is a valid DB2 authorization ID

**=mapped_user* is required when anonymous authentication is configured for the OS/390 server (ServiceAuthMethods=Anonymous and MVSServiceSecurity=SAFNONE).

Type=Dynamic

MVSUIDDefaultAccess

Specifies the default action for a user ID (UID) map. Valid values are:

- PERMIT=If user ID mapping is set for the SequeLink service and the user ID cannot be found in the UID map, the connection is accepted.
- DENY=If user ID mapping is set for the SequeLink service and the user ID cannot be found in the UID map, the connection is refused.

Type=Dynamic

MVSUIDMapDescription

Specifies a general description of the user ID (UID) mapping table. The valid value is a defined user ID map name.

Type=Dynamic

ServiceAdminAuthMethods

Specifies one or multiple authentication mechanisms that the SequeLink Manager can use to authenticate itself to the server. Valid values are:

- Anonymous
- integrated_nt
- OSLogon(UID,PWD)

For more information about SequeLink security features, see [Chapter 12 “Configuring SequeLink Security” on page 241](#).

Type=Dynamic

ServiceAdministrator

Sets authorization for users who are allowed to manage SequeLink services using the SequeLink Manager.

NOTES:

- On Windows NT, users who are allowed to manage SequeLink services using the SequeLink Manager must have NT administrator rights.
- On Windows and UNIX, specify `everyone` when `ServiceAuthMethod=anonymous`.

Valid values for the ServiceAdministrator attribute are:

- *user_name*= the user ID of a user who is allowed to use the SequeLink Manager. To configure authorization for multiple users, you must set this attribute multiple times, one instance of the attribute for each user. For example:

```
ServiceAdministrator=RSMITH
ServiceAdministrator=DJONES
ServiceAdministrator=TCONRAD
```



NOTE: On Windows NT servers, you must prefix the user ID with the Windows NT server name or the Windows NT domain name, for example, SALES\DJONES. When connecting, the user must also prefix the user ID with the Windows NT server name, if connecting to a local server, or the Windows NT domain name.

NOTE: Alternatively, you can set the ServiceAdministratorGroup attribute to configure authorization for groups of users defined on Windows NT or UNIX. For more information about configuring authorization for user groups on Windows NT and UNIX, see [“ServiceAdministratorGroup” on page 400](#)

- *authenticated*= any user who can provide a valid host user ID and password or who uses Integrated NT authentication will receive the same authorization.
- *everyone*= all connections will receive the same authorization level, regardless of how they are authenticated.

For more information about configuring SequeLink security, see [Chapter 12 “Configuring SequeLink Security” on page 241](#).

Type=Dynamic

ServiceAdministratorGroup

Sets authorization for defined Windows NT and UNIX user groups who are allowed to manage SequeLink services using the SequeLink Manager. Valid values are user groups defined on Windows NT or UNIX.

To configure authorization for multiple user groups, you must set the ServiceAdministrator attribute multiple times, one time for each user group. For example:

```
ServiceAdministratorGroup=SLUSERG1
ServiceAdministratorGroup=SLUSERG2
ServiceAdministratorGroup=SLUSERG3
```



NOTE: On Windows NT servers, you must prefix the user group ID with the Windows NT server name or the Windows NT domain name where the group is defined, for example, SALES\SLUSERG1.

For more information about configuring SequeLink security, see [Chapter 12 "Configuring SequeLink Security" on page 241](#).

Type=Dynamic

ServiceAuthMethods

Specifies one or multiple authentication mechanisms the service accepts. The client must select the supported mechanism to authenticate itself to the server. Valid values are:

- Anonymous
- integrated_nt
- OSLogon(UID,PWD)
- OSLogon(HUID,HPWD)

For more information about configuring SequeLink security, see [Chapter 12 "Configuring SequeLink Security" on page 241](#).

Type=Dynamic

ServiceCancelEnabled

Specifies whether cancelling connection requests using SQLCancel is supported. Valid values are:

- TRUE=yes
- FALSE=no

The default is TRUE.

Type=Static

ServiceCatchExceptions

Specifies how the SequeLink service will handle exceptions. Valid values are:

- TRUE=The service will attempt to recover from unexpected exceptions.
- FALSE=The exception is passed to the operating system resulting in an error or core dump.

The default is TRUE.

Type=Static

ServiceCodePage

Controls transliteration for the SequeLink service. Valid values are:

- Default=SequeLink supports only standard ASCII/EBCDIC transliteration.
- OS=The client transliterates character data from the code page the SequeLink service is using to the code page of the client application/system.

The default is Default.

Type=Dynamic

ServiceConnectInfo

Specifies the TCP/IP port on which the service is listening for connection requests. The port is specified using the format:

tcp://host.port

where *host* is the name of the host on which the SequeLink service runs and *port* is an available TCP port.

Type=Static

ServiceConnectionModel

Specifies the connection model to be used for connections to the SequeLink service. Valid values are:

- **ThreadPool**=A pool of threads is created with **ServiceMinThreads** prestarted threads and maximum **ServiceMaxThreads** threads. This thread pool is used to service client connection requests. (Windows NT and UNIX)
- **Process/Connection**=SequeLink creates a separate OS process (task on OS/390) to service client connection requests.
- **Thread/Connection**=SequeLink creates a separate thread for each client connection requests. (Windows NT and UNIX)

For Windows NT and UNIX, the default is **ThreadPool**.

For OS/390, the only valid value is **Process/Connection**.

Type=Static

ServiceDeadCntDetInt

Specifies the interval in seconds between requests that are sent from the SequeLink Server to the SequeLink Client to verify the availability of the SequeLink Client. Valid values are 0 and from 61 to 1000000.

A value of 0 disables the dead client detection feature.

The default is 600.

Type=Static

ServiceDebugLogLevel

Specifies the level of detail for messages logged in the debug log file. One or multiple message levels can be enabled/disabled. Valid values are:

- Fatal
- Error
- Warnings
- Information
- Debug
- SSP Packet log
- SSP Requests

The default is Fatal.

NOTE: The value of this attribute is a bitmask with each bit having the following decimal values when turned on:

Fatal:	Bit 0=1
Error:	Bit 1=2
Warnings:	Bit 2=4
Information:	Bit 3=8
Debug:	Bit 4=16

SSP Packet Log: Bit 5=32
SSP Requests: Bit 6=64

If you set this attribute using a SequeLink Manager command that prompts for a decimal value, such as the `ServiceAttributeReplace` command, the value you set must equal the total decimal value of the bits you want to turn on. For example, if you want to turn all bits on, meaning all options would be logged, you would set the attribute to 127 ($1+2+4+8+16+32+64=127$). To turn off all bits, set the attribute to 0.

Type=Dynamic

ServiceDebugLogPath

Specifies the directory where debug log files are written.

On Windows NT and UNIX: Contains the directory in which debug log files will be written.

On OS/390: Contains a prefix for the data set name for debug log files. This value is suffixed with the thread ID of the client connection.

Type=Static

ServiceDescription

Specifies a general description of the SequeLink service. The valid value is a defined description of the service.

Type=Static

ServiceDetailedOSLogonErrors

Specifies what type of error will be returned when the OSLogon based authentication fails. Valid values are:

- TRUE= a detailed error will be returned.
- FALSE= a generic error will be returned.

The default is TRUE.

Type=Dynamic

ServiceEncryptionAlgorithm

Specifies the data scrambling algorithm used when sending requests or replies across the network between client and server. Valid values are:

- None
- DES
- 3DES
- Byteswap

The default is None, which means cleartext.

For more information about configuring SequeLink security, see [Chapter 12 “Configuring SequeLink Security” on page 241](#).

Type=Static

ServiceEnvironmentVariable

Specifies a list of variables that will be set before the SequeLink service is started. The syntax for valid values is *varname=value*. For example, ORACLE_SID=ORA8i.

To define more than one variable, you must add more than one instance of the attribute to your service.

Type=Static

ServiceEventTraceLocation

Specifies the directory where the event trace file is located. The valid value is a defined location for the Service event trace file.

The default is an empty string.

Type=Static

ServiceEventTraceSize

Specifies the size (in bytes) of the event trace file. Valid values are between 10000 and 2000000000.

The default is 1000000.

Type=Static

ServiceEvQPingTimeout

Specifies the timeout (in milliseconds) the SequeLink Agent will wait for a SequeLink data access service response while determining whether the service is started.

The default is 1000.

Type=Static

ServiceEvQShmMonitorSize

Specifies the size of the shared memory segment (in bytes) to be used for the shared monitor counters. The shared monitor counters are monitor values that are accessible using the Windows NT performance monitor integration.

The default is 4096.

Type=Static

ServiceExecPath

Specifies the path of a SequeLink Server executable and is used differently depending on platform. The valid value is a defined location of a SequeLink server executable.

- On Windows NT: The value of the ServiceExecPath is used when registering the service.
- On UNIX: The value of ServiceExecPath is used by the SequeLink Agent when starting the service.

Do not alter this attribute.

Type=Static

ServiceExecPath2

Specifies the path of a SequeLink server executable to start by SequeLink service starter. The valid value is a defined location of a SequeLink server executable.

Type=Static

ServiceHost

Specifies the name of the host on which the SequeLink service is installed.

Type=Dynamic or Static

ServiceINFMaXNrActStat

Specifies the maximum number of active statements that are allowed for each connection to an Informix database.

The default is 250.

Type=Dynamic

ServiceInternalTimeout

The number (in milliseconds) that thread pool synchronization actions block before generating an internal error. Valid values are positive numbers.

The default is 60000.

Type=Static

ServiceLanguage

The specified language for SequeLink messages. The only valid value and the default is 1= English.

Type=Static

ServiceMaxSessions

Specifies the maximum number of sessions a multithreaded SequeLink Server will accept.

The default is 0.

Type=Dynamic

ServiceMaxThreads

The maximum number of threads that can be started in the thread pool. Valid values are from 6 to 64000.

The default is 64.

Type=Static

ServiceMessageFile

The location of the service message file:

On Windows NT: The valid value is the path to a resource only DLL.

On UNIX: The valid value is the path to a .cat file.

Type=Static

ServiceMinThreads

The number of pre-started threads that will be started in the thread pool. Valid values are from 6 to 64000.

The default is 8.

Type=Static

ServiceName

When a SequeLink service is created, this attribute specifies the name of the service, which can be no longer than 8 characters. The value should not be changed.

Type=Dynamic or Static

ServiceORASerializeLogon

Specifies whether all Oracle API calls that are executed to establish a connection with the Oracle database are serialized. Valid values are:

- TRUE=yes
- FALSE=no

The default is TRUE.

Type=Static

ServiceRegisterTCPPort

Specifies whether the TCP/IP port will be registered automatically in the operating systems services file (/etc/services on UNIX or

%SystemRoot%\system32\drivers\etc\services on Windows NT, for example).

- TRUE= the TCP/IP port used by the SequeLink service will be registered automatically in the operating system services file.
- FALSE=the TCP/IP port used by the SequeLink service will not be registered automatically in the operating system services file

The default is FALSE.

Type=Static

ServiceResolveHostNames

Specifies how host names are resolved. Valid values are:

- TRUE=Information about connected clients is displayed using symbolic system names.
- FALSE=Information about connected clients is displayed in an IP format.

The default is FALSE.

Type=Static

ServiceUnixSyslogFacility

Facility with which all SequeLink syslog messages are logged. Valid values are:

- USER
- LOCAL0-LOCAL7

The default is USER.

Type=Dynamic

ServiceUser

Sets authorization for users who are allowed to access the service for data access.

On Windows and UNIX: Specify everyone when ServiceAuthMethods=anonymous. To configure authorization for multiple users, you must set the ServiceUser attribute for each user. Valid values are:

- `user_id=` the user ID of a user who is allowed to use the SequeLink service. To configure authorization for more than one user, you must configure this attribute multiple times, one instance for each user.



NOTE: On Windows NT servers, you must prefix the user ID with the Windows NT server name or the Windows NT domain name, for example, SALES\DJONES.

NOTE: Alternatively, you can set the ServiceUserGroup attribute to configure authorization for groups of users defined on Windows NT or UNIX. For more information about configuring authorization for user groups on Windows NT and UNIX, see ["ServiceUserGroup" on page 413](#).

- `authenticated=` any user who can provide a valid host user ID and password or who uses Integrated NT authentication will receive the same authorization.
- `everyone=` all connections will receive the same authorization level, regardless of how they are authenticated.

For more information about configuring SequeLink security, see [Chapter 12 "Configuring SequeLink Security" on page 241](#).

Type=Dynamic

ServiceUserGroup

Sets authorization for defined Windows NT and UNIX user groups who are allowed to access the service for data access. Valid values are user groups defined on Windows NT or UNIX.

To configure authorization for multiple user groups, you must set the ServiceAdministrator attribute multiple times, one time for each user group. For example:

```
ServiceUserGroup=SLUSERG1  
ServiceUserGroup=SLUSERG2  
ServiceUserGroup=SLUSERG3
```



NOTE: On Windows NT servers, you must prefix the user group ID with the Windows NT server name or the Windows NT domain name where the user group is defined, for example, SALES\SLUSERG1.

For more information about configuring SequeLink security, see [Chapter 12 “Configuring SequeLink Security” on page 241](#).

```
Type=Dynamic
```


E SequeLink Events

This appendix lists the SequeLink events, describes the events, lists the attributes associated with the events, and explains how to write a filter for an event.

SequeLink Events

[Table E-1](#) lists SequeLink events and the attributes that apply to each attribute. See [Table E-2](#) for the definition of the attributes.

Table E-1. SequeLink Events

Event	Description
DataSourceSet Attributes: SessionId, ClientInfo, DataSourceName	Data Source for the specified session.
DbmsSessionStarted Attributes: SessionId, ClientInfo, ServiceUser, DbmsSessionId, DbmsUser	DBMS Connection opened.
DbmsSessionStopped Attributes: SessionId, ClientInfo, ServiceUser, DbmsSessionId, DbmsUser	DBMS Connection closed.

* These attributes cannot be specified within a filter.

Table E-1. SequeLink Events (cont.)

Event	Description
ErrorInternal Attributes: ErrorCode, ErrorMessage, [SessionId, ClientInfo, ServiceUser]	Fatal error occurred.
ErrorOccurred Attributes: ErrorCode, ErrorMessage, [SessionId, ClientInfo, ServiceUser]	Error occurred.
EvProcStarting Attributes: none	Event Processing is started.
EvProcStopping Attributes: none	Event Processing is stopped.
NetPacketRead Attributes: SessionId, ClientInfo, ServiceUser, NumberOfBytes	Packet read from network (from client).
NetPacketWrite Attributes: SessionId, ClientInfo, ServiceUser, NumberOfBytes	Packet written to network (to client).
RowsFetched Attributes: SessionId, ClientInfo, ServiceUser, StatementId, RowsFetched	Rows fetched from the DBMS.

* These attributes cannot be specified within a filter.

Table E-1. SequeLink Events (cont.)

Event	Description
ServiceParams Attributes: DebugLogLevel*	Service Parameters.
ServiceStarted Attributes: none	Service started.
ServiceStopping Attributes: none	Service stopped.
SessionAuthenticated Attributes: SessionId, ClientInfo, ServiceUser, Authorization	Authentication succeeded.
SessionParams Attributes: SessionId, ClientInfo, DebugLogLevel*	Session Parameters.
SessionStarted Attributes: SessionId, ClientInfo, Authorization, DataSourceName, ClientApi	Session started.

* These attributes cannot be specified within a filter.

Table E-1. SequeLink Events (cont.)

Event	Description
SessionStopped Attributes: SessionId, ClientInfo, ServiceUser, ReceivedPackets*, SumReceivedPackets*, MinReceivedPackets*, MaxReceivedPackets*, SentPackets*, SumSentPackets*, MinSentPackets*, MaxSentPackets*, RowsFetched, ExecuteCount, TxnPrepare, TxnCommit, TxnRollback	Session stopped.
StatementClosed Attributes: SessionId, ClientInfo, ServiceUser, StatementId, RowsFetched, RowsAffected, ExecuteCount	DBMS Statement closed.
StatementExecuted Attributes: SessionId, ClientInfo, ServiceUser, StatementId, Statement, RowsAffected, ReturnCode, Statement	DBMS Statement executed.
StatementOpened Attributes: SessionId, ClientInfo, ServiceUser, StatementId	DBMS Statement opened.
TransactionCommit Attributes: SessionId, ClientInfo, ServiceUser	DBMS Transaction Committed.

* These attributes cannot be specified within a filter.

Table E-1. SequeLink Events (cont.)

Event	Description
TransactionPrepare Attributes: SessionId, ClientInfo, ServiceUser	DBMS Transaction prepared.
TransactionRollback Attributes: SessionId, ClientInfo, ServiceUser	DBMS Transaction rollback occurred.

* These attributes cannot be specified within a filter.

SequeLink Event Attributes

Table E-2 describes each event attribute.

Table E-2. Event Attributes

Event Attribute	Description	Type
Authorization	Session authorization (Administrator, User).	String
ClientApi	Type of client application (for example, Administrator, ODBC, ADO/OLE DB, or JDBC).	String
ClientInfo	IP address or host name of the client system.	String
DataSourceName	Identification of the data source used for the session.	String
DbmsSession	Identification of the DBMS session.	String
DbmsUser	User used to open the DBMS session.	String
ErrorArgument	One or more arguments completing the ErrorMessage attribute.	String
ErrorCode	Numeric error code associated with an error event.	Integer
ErrorMessage	Error text.	String
EventId	Numeric identification of the event.	Integer
ExecuteCount	Number of SQL statements executed.	Integer
NumberOfBytes	Number of bytes sent or received.	Integer

Table E-2. Event Attributes (cont.)

Event Attribute	Description	Type
ReturnCode	Result of statement execution: 0 when OK, -1 when Error, -2 when Warning.	String
RowsAffected	Rows affected by SQL statement(s).	Integer
RowsFetched	Number of rows fetched.	Integer
ServiceName	Name of the service generating the event.	String
ServiceUser	Authenticated user.	String
SessionId	Numeric identification of the session.	Integer
Statement	SQL statement.	String
StatementId	Numeric identification of the session.	Integer
Timestamp	Timestamp when event occurred.	String
TxnCommit	Number of transactions committed.	Integer
TxnPrepare	Number of transactions prepared.	Integer
TxnRollback	Number of transaction rollbacks.	Integer

Filtering Events

You can place a filter on the attributes of any event. For example, if you want to monitor and trace only sessions that are started by users, not administrators, you would write the following filter for the Session Started event:

```
${Authorization} = "user"
```

The syntax for a filter placed on an event is:

```
[not] [(!${event_attribute} assign_operator filter_value)]
[boolean_operator (${event_attribute} assign_operator
filter_value)...]
```

where:

assign_operator is one of the following assignment operators:

=	>	equals	bigger	nsmaller
!=	<=	nequals	nbigger	
<	>=	contains	smaller	

You can use the symbols or the words; they are equivalent (for example, using != is the same as using nequals).

filter_value is the value for the attribute. The value can be a string or an integer, depending on the attribute type (see [Table E-2 on page 420](#)). Strings must be quoted.

boolean_operator is one of and, nand, or, nor, xor, nxor

For example:

```
[not] (${ServiceUser} equals "sluser")
```

```
(${ClientInfo} contains "196.72") and (${RowsFetched} >  
1000)
```

```
(${Statement} contains "insert") and (${ReturnCode} != 0)
```

```
(${Statement} contains "insert" and (${ReturnCode} = -1 or  
${ReturnCode} = -2)
```

NOTE: Strings must be quoted, and the assignment operator "contains" can only be used in combination with string constants.

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